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### Animal Abuse amongst Young People aged 13 to 17

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ANIMAL ABUSE AMONGST YOUNG  
PEOPLE AGED 13 TO 17:  
TRENDS, TRAJECTORIES AND LINKS  
WITH OTHER OFFENDING

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Report prepared for the RSPCA  
June 2007

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## EXECUTIVE SUMMARY

- Between the ages of 13 and 17, 13% of respondents to the Edinburgh Study of Youth Transitions and Crime stated that they had “harmed or injured an animal or bird on purpose”.
- Most of those who had abused an animal had done so only once or twice, although a substantial minority had done so on a frequent basis.
- The greater the length of time over which a young person offended, the more frequent their offending was likely to be.
- Frequency of animal abuse peaked between age 14 and 15, and then gradually declined to age 17.
- Animal abuse is less common than other types of violence, like interpersonal assault, but frequency of offending is very similar for these violent offences.
- In comparison to non-violent forms of offending, prevalence of animal abuse is most similar to serious offences (e.g. housebreaking and theft from motor vehicles); however, frequency of animal abuse is more similar to less serious offences (e.g. breach of the peace and shoplifting).
- Young people involved in animal abuse shared many characteristics with those involved in other types of violence. All violent offenders (including animal abusers) are quite different from non-violent offenders and non-offenders.
- Animal abusers are a highly problematic, risk prone and vulnerable group. Compared to other violent offenders, they are more impulsive, less committed to school, more likely to be involved in a gang, more likely to drink and take drugs, highly victimised and more likely to self harm.
- For most low level animal abuse is a transient stage that forms part of a more general pattern of low level interpersonal violence. Persistent and frequent animal abuse is often accompanied by persistent and frequent interpersonal violence, which indicates a more entrenched culture of violence. The later animal abuse starts, the less it appears to be linked to interpersonal violence in adolescence.
- There are some early warning signs that could form useful markers in terms of general prevention and intervention, but early prediction of animal abuser type is problematic. Involvement in animal abuse is most likely to be precipitated by individual and situational circumstances that coincide with the time of offending, rather than influences or characteristics in early adolescence.
- Prevention strategies that start in primary school and continue into secondary education may be beneficial, but animal abuse should be ‘mainstreamed’ alongside other forms of violence. Group work that challenges attitudes and behaviours, especially amongst boys, is recommended.
- Generic intervention for young people identified by agencies as vulnerable, problematic and risk prone is recommended over trying to predict future offenders based on early involvement in interpersonal violence. This is unlikely to correctly identify many abusers, and could potentially damage individuals who are wrongly targeted for intrusive intervention.
- This study was not able to explore the extent to which child abuse or neglect, or general experience of domestic violence, contributed towards involvement in animal abuse. This is clearly an area that requires further examination.

# INTRODUCTION

## Background

Despite a growing body of literature in the US, the study of violence against animals has been a largely ignored aspect of criminological inquiry in the UK. Self-report offending surveys, such as the Offending Crime and Justice Survey which covers England and Wales, tend to ignore the less 'mainstream' forms of offending behaviour (see Budd et al 2005). As a result there is little statistical information available on the extent of animal abuse, trends and patterns in this type of behaviour or the characteristics of abusers in this country. It has been suggested that this gap in the research base may be due to the lower level of importance placed on animal cruelty than on forms of interpersonal violence, which is exemplified by higher levels of non-prosecution of such cases and lower criminal sanctions against offenders towards animals (Vollum et al 2004).

The notion that animal cruelty is linked to other forms of offending behaviour, particularly interpersonal violence, can be dated as far back as 1705 when John Locke stated that "they who delight in the suffering and destruction of inferior creatures, will not be apt to be very compassionate or benign to those of their own kind" (cited in Ascione and Arkow 1999). In America, there is a considerable amount of research evidence which has identified links between animal abuse and various other problematic behaviours, both violent and non-violent (for a review see Ascione 2001). There is also a broad literature on the links between animal abuse and wider familial violence, including both child maltreatment and domestic violence between adults (see Ascione and Arkow 1999). However, little is known about the precise relationship between animal abuse and other forms of interpersonal violence, including what the individual developmental trajectories of such behaviours are and how these inter-relate.

The self-reported offending of young people themselves has provided some research evidence on the link between animal abuse and other forms of offending. Ascione (2001) presents a review of studies relating childhood animal abuse to various non-violent offending behaviours, including vandalism and fire-raising. Particular attention has been paid to the links between animal abuse and interpersonal violence. Youssef et al (1999 cited in Ascione 2001) found that 10% of violent youngsters reported also being cruel to animals compared with only 2% of the non-violent group. Wochner and Klosinski (1988 cited in Bell 2001) found that 32% of animal abusers had also demonstrated sadistic behaviour towards humans, compared with 12% of non-abusers. Henry (2004) also found that college students who had observed or participated in acts of animal cruelty had higher self-report delinquency scores, including violence, than those who had not.

Studies of convicted offenders and prison populations have provided further evidence of such a link (see Ascione 2001). Arluke et al (1999) found that people arrested for animal abuse were more likely than non-abusers to have been arrested for a range of violent, property, drug and public order offences. Prevalence of animal abuse tends to be highest amongst those convicted for violent crimes. In a South African study, Schriff et al (1999 in Ascione 2001) found that 63% of men imprisoned for violent crimes reported cruelty to animals compared with 11% of non-violent prisoners.

Similar results have been found for female prisoners. Animal abuse is also high amongst those who have committed sexual crimes. Tingle et al (1986 in Ascione 2001) found that 48% of rapists and 30% of child abusers reported abusing animals in childhood. The populations of such studies have tended to be small, however (Tingle et al's study was based on only 64 individuals, for example).

Some researchers have attempted to study the progression or graduation from animal abuse to other serious forms of interpersonal violence, including murder (Wright and Hensley 2003). Ascione (1999) has claimed that abusing animals may lead to further violence as it desensitises the perpetrator and reduces their ability to empathise with victims, whether animal or human. However, this graduation thesis has been criticised on the basis that such research tends to focus on offenders convicted of serious violent offences, which results in a consequential fallacy in the link between violence and early animal cruelty (Piper 2003). The potential impact of such a fallacy is that all children who have harmed animals may be wrongly labelled as pathological and at risk of serious offending (Piper et al 2001, 2003). There is, therefore, a need for longitudinal evidence to explore the extent to which animal abusers actually go on to engage in serious interpersonal violence and, if so, the importance of animal abuse as an influencing factor (Beirne 2004).

There has been at least one attempt to construct a typology of animal abusers. Ascione, Thompson and Black (1997 cited in Ascione 2001) proposed a typology for animal abusers which was based on a similar exercise that had been carried out with fire-setters. They identified three potential offender groups: 'exploratory or curious animal abusers' who were young, poorly supervised and lacking basic training in animal care; 'pathological animal abusers' who were older children for whom animal abuse was symptomatic of other psychological disturbances; and 'delinquent animal abusers' who were adolescents who committed animal abuse alongside other anti-social activities and for whom it may be linked to gang membership. Although the existence of such groups seems feasible in theory, it is acknowledged by Ascione (2001) that there is little empirical information on which to develop or substantiate such a typology. In particular, there is a lack of longitudinal information about animal abuse histories which would be necessary to properly construct and evaluate such offender taxonomies.

Overall, the literature leaves many questions unanswered about the prevalence and frequency of animal abuse, characteristics of abusers, reasons for such behaviour and the developmental inter-relationships between this and other forms of offending. Ascione (2001) has claimed that although violent behaviour is "multidimensional and multi determined" research into animal abuse may help to identify young people at risk of perpetrating future interpersonal violence. However, there is a danger of extrapolating too far from the existing, essentially descriptive, research to falsely label young people on the basis of predictions of how they may have behaved in the future. There is also too little data available to develop meaningful offender typologies that might be used to explore differing rationales behind violence towards animals. These gaps in the existing literature highlight a clear need for longitudinal research to explore the developmental trajectories of animal abusers and examine the characteristics of different offender groups.

## **Aims of the report**

The aims of this report are four-fold:

- to examine the prevalence and frequency of animal abuse during adolescence and compare this with involvement in other forms of both violent and non-violent delinquent behaviours;
- to investigate a broad range of characteristics amongst those who get involved in animal abuse, other violent behaviour, non-violent offending and non-offenders;
- to identify how offending trajectories of abuse against animals develop over time and compare this to trajectories of interpersonal violence;
- and to isolate those characteristics that best explain different animal abuse offending trajectories.

## **Method of the study**

This report is based on detailed analysis of data collected by the Edinburgh Study of Youth Transitions and Crime. The Edinburgh Study is a prospective, longitudinal study of criminal offending amongst a large cohort of young people in the Scottish capital. The main aim of the study is to investigate the factors and processes that lead some young people to become involved in serious and persistent criminal offending, with a particular emphasis on gender differences.<sup>1</sup> The study involves a cohort of around 4,300 young people who started secondary school in the city of Edinburgh in the autumn of 1998, when they were aged 12 on average.<sup>2</sup> The design of the study includes six annual sweeps of self-report data collection from cohort members and collection of data from a range of official agencies, including police, social work, the Children's Reporter and schools. The analysis for this report draws on both self-report data and information held by official agencies.

The data on which this report is based were collected between sweeps 2 and 6 of the Edinburgh Study, when the cohort members were aged between 13 and 17 years, on average. Offending at sweep 1 is excluded as questions about animal abuse were not asked at this sweep. At sweep two, cohort members were asked a screener question which was 'during the last year, did you hurt or injure any animals or birds on purpose?'<sup>3</sup> Those answering 'yes' were asked a series of follow-up questions, including how many times they had done this; whether they had got into trouble for doing it from an adult or the police; what type of animal or bird was involved; whether it was a pet or wild animal/bird; and how many friends had they acted with at the time. At subsequent sweeps, cohort members were asked the same screener question, although a smaller number of follow up questions were asked due to space restrictions.

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<sup>1</sup> Further information about the study's aims and methods can be found in Smith and McVie (2003).

<sup>2</sup> The study achieved 89% coverage of the eligible pupil population. Eight per cent of the school population were attending non-participating, private schools; whilst a further three per cent of children were withdrawn from taking part by parents at the consent stage.

<sup>3</sup> The reference period for sweep two was the last school year, from September 1998 to August 1999.

Cohort members were not given a strict definition of ‘animal abuse’ but it was verbally stipulated that legitimate hunting or fishing activities should not be reported. Nevertheless, it was evident during data analysis that some individuals may have reported such instances. There were three schools (all in the independent sector) in which prevalence of animal abuse was significantly higher than any of the others (even taking account of the variable spread of prevalence between schools). Since it is likely that many of these reports included supervised sporting activities, pupils who attended any of these three schools were excluded from the analysis (n=118).

## **Structure of the report**

This report consists of four substantive sections. The first explores the extent of animal abuse amongst the Edinburgh study cohort from age 13 to age 17, using descriptive analysis of the prevalence and frequency of such behaviour. In order to set this within some kind of behavioural context, trends in other forms of offending – both violent and non-violent – are also included in this section. The second section details the personal, familial, social and environmental characteristics of those involved in animal abuse compared with other violent offenders, non-violent offenders and non-offenders. This includes gender, socio-economic status, personality factors, family factors, school factors, neighbourhood factors, substance use and experience of victimisation and self-harm.

Section three shows the trajectories of involvement in animal abuse from age 13 to 17 amongst known offenders, using group based semi-parametric modelling. This allows animal abusers to be classified into groups based on the frequency of their individual offending over time. Trajectories of interpersonal animal abuse are compared with trajectories of interpersonal violence. The fourth section of the report further explores the animal abuse trajectory groups (identified in section three) using a series of multivariate models, which are specified to examine those characteristics (described at stage 2) that most strongly explain involvement in animal abuse. Multivariate models are constructed in such a way as to use early behaviour as explanatory variables, to assess the extent to which certain characteristics might predict later involvement in animal abuse. The final section of this report consists of a short concluding chapter which draws together the key findings and identifies some policy implications.

## **Methodological note**

Analysis of offender data in this report is largely based on multiply imputed data for a sample of 4157 individuals (for whom sufficient information was available to conduct such an exercise), so that the impact of missing data is minimised. The exception to this is the trajectory analysis, where non-imputed data were used since the modelling process itself takes account of missing cases and makes statistical assumptions about the appropriate values to apply (see appendix 1 for details of imputation).

Findings that are remarked to be *significant* will pass the criteria of statistical significance at either the 90% or 95% level according to the p-value measured (i.e.  $p < .10$  or  $p < .05$ ). If the level of significance is greater than the 95% level, this will be noted in the text.

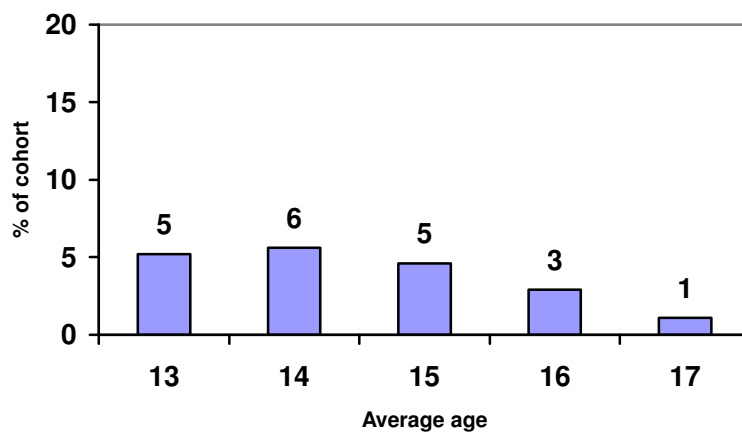


## SECTION 1: TRENDS IN ANIMAL ABUSE AND OTHER FORMS OF OFFENDING

### Prevalence and frequency of animal cruelty

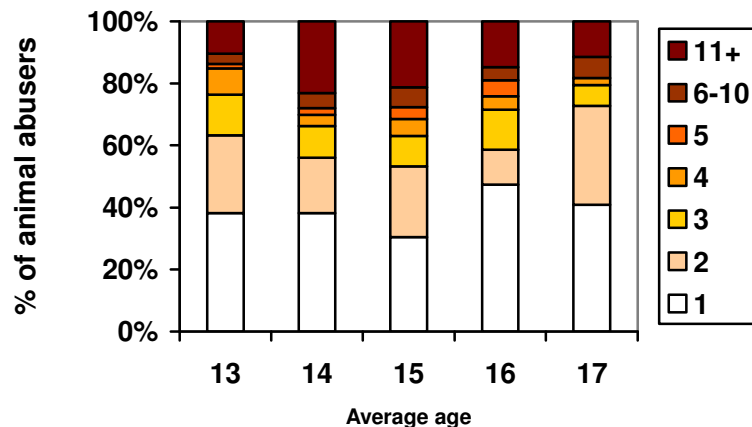
In this survey young people were asked whether they had ‘hurt or injured any animals or birds on purpose’ during the course of the previous year. On the whole, prevalence of animal cruelty (as defined in this way) was very low in comparison to other forms of adolescent offending, both violent and non-violent. Figure 1 shows the proportion of cohort members who reported committing animal cruelty remained relatively constant between ages 13 and 15 (there was no significant difference in prevalence) before declining significantly at both ages 16 and 17. At its peak, only just over 1 in 20 people admitted involvement in this form of behaviour at any one sweep.

**Figure 1: Prevalence of animal cruelty from sweep 2 to 6**



Looking in more detail at the number of times young people who admitted animal cruelty had actually offended, some distinct patterns emerge. Figure 2 illustrates the frequency of animal cruelty amongst offenders at each sweep (those who did not commit this form of crime are excluded here). Two key points are evident from this chart. First, a large proportion of offenders (more than 50% at each sweep) reported committing only one or two acts of animal cruelty within any one year. So, although such behaviour is problematic, it appears that for many it is an infrequent and sporadic occurrence. On the other hand, a sizeable minority of offenders reported participating in this type of behaviour on a fairly frequent basis. One sixth or more of animal abusers at each sweep said they had done this on six or more occasions in the last year alone, and at ages 14 and 15 almost a quarter of offenders admitted to hurting or injuring animals or birds on more than 10 occasions during the previous year. The average number of offences committed by animal abusers at age 13 was 3.0, which increased significantly to 4.2 at age 14, before declining steadily at each sweep to 3.0 again at age 17 (exact figures are shown in figure 5, below).

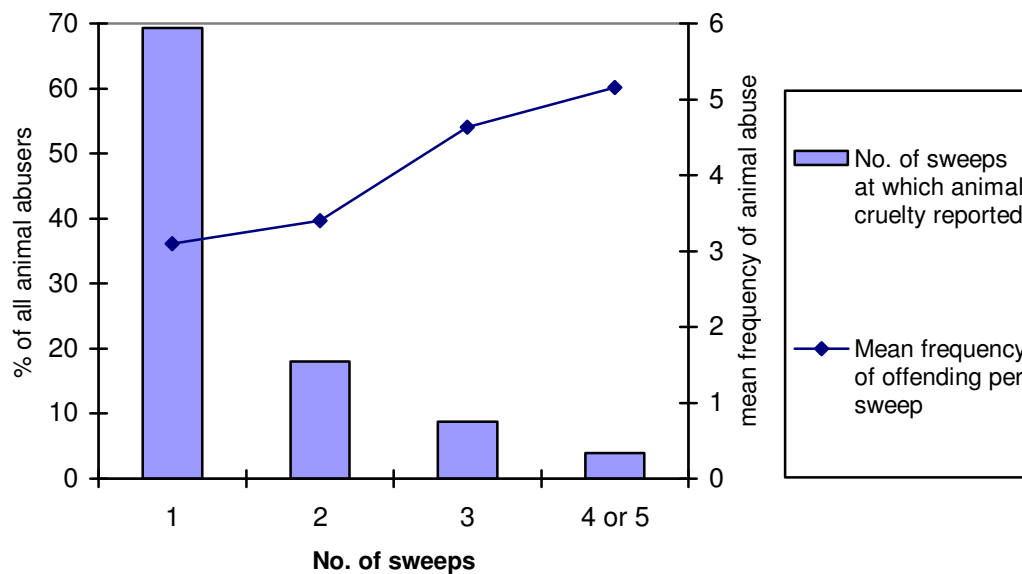
**Figure 2: Number of incidents of animal cruelty in last year amongst offenders from sweep 2 to 6**



In order to get a better picture of young people's involvement in animal cruelty, the full extent of their offending across the five sweeps was explored. In all, 13% of cohort members stated that they had hurt or injured an animal or bird on purpose at some point between the ages of 13 and 17. Figure 3 shows that two thirds (69%) of these children reported offending at one sweep, indicating a fleeting involvement in such behaviour for most young people. Around 1 in 5 (18%) animal abusers reported offending at two sweeps of the study; while the remainder (13%) had harmed an animal or bird over the course of three or more years and potentially pose a more worrying group of offenders.

There was a positive relationship between the number of sweeps at which young people said they had committed animal abuse and the number of incidents of animal cruelty that were reportedly committed. Those who offended at only one sweep reported an average of 3.2 offences against animals in total, compared with an average of 31.7 for those who offended at all five sweeps. In fact, there was a statistically significant increase (at least  $p < .05$ ) in the mean frequency of animal abuse for every additional sweep that a young person had participated in this behaviour. Of course, counting the total number of offences is slightly misleading, since a person may have committed a larger number of offences in total without having increased their frequency of offending over time. Figure 3 shows that the average offending rate also increased by duration of offending, suggesting that the longer young people are involved in harming animals, the greater risk they present in terms of the number of offences they are likely to commit.

**Figure 3: Relationship between duration of animal cruelty and average offences per sweep**

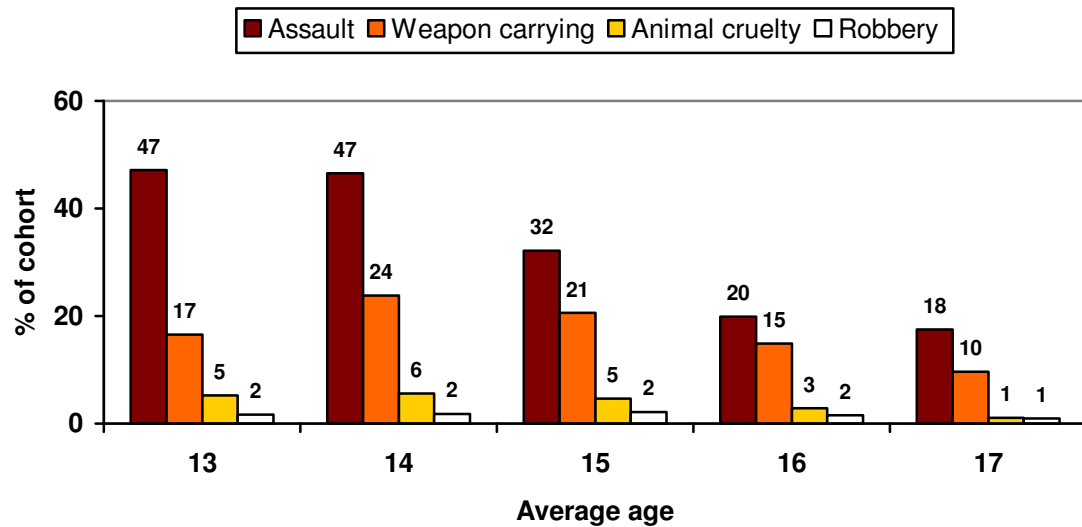


### Comparison with other forms of violent offending

Over the five sweeps included in the analysis for this report, the cohort members were asked about three other forms of offending which could be described as involving actual, threatened or intended violence. The prevalence of these behaviours is shown in figure 4, which indicates that animal abuse is a rare occurrence in comparison to some other forms of violence. By far the most commonly reported type of violence was assault, which is defined as ‘hitting, kicking or punching someone with the intention of really hurting them’. Around half of all cohort members at ages 13 and 14 indicated that they had assaulted someone during the previous year, although this proportion declined significantly ( $p<.001$ ) between ages 14 and 17.

A far lower proportion of the cohort reported ‘carrying a knife or other weapon with you for protection or in case it was needed in a fight’, although this was still substantially more prevalent than animal abuse. Prevalence peaked at age 14, when around a quarter of the cohort admitted carrying a weapon, but declined significantly ( $p<.001$ ) at subsequent sweeps. The only form of violence measured in this study that was less common than animal abuse was robbery, defined as ‘stealing money or property that someone was holding carrying or wearing at the time’. Only 2% or less of the cohort at each sweep reported involvement in robbery.

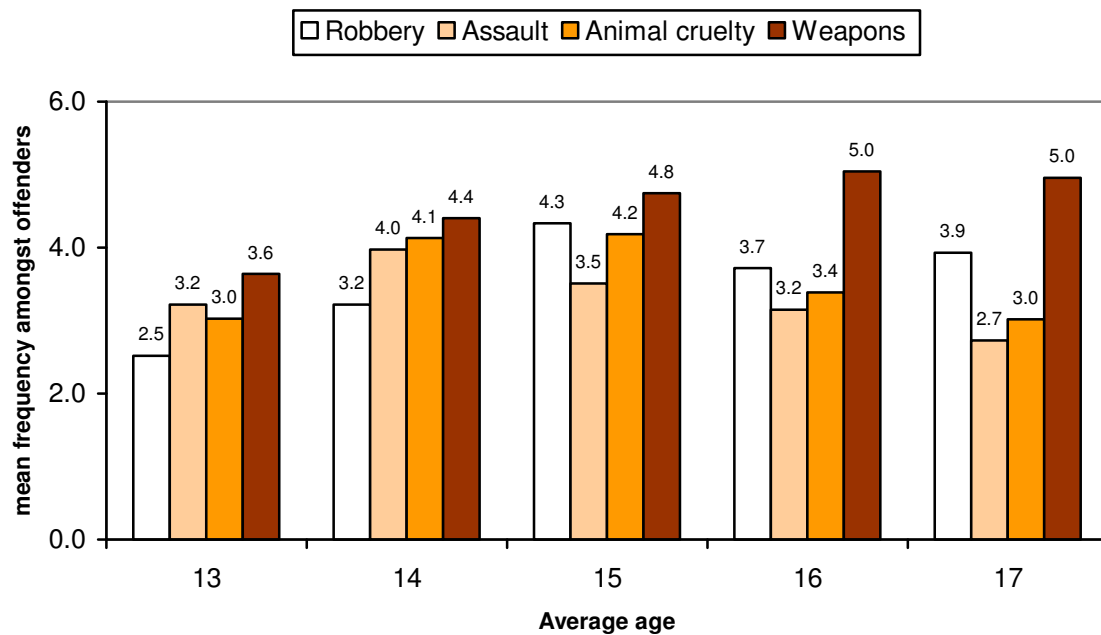
**Figure 4: Prevalence of other forms of violence from sweep 2 to 6**



Looking just at the offenders within each offence type, figure 5 shows the average number of incidents committed per year. There was considerable variation between offence types both within sweeps and in trends over time. Overall, weapon carrying was the most frequently committed offence at every sweep (at least  $p < .05$ ). Frequency of weapon carrying increased significantly between ages 13 and 14, and then stabilised (there were slight changes thereafter, but these were not statistically significant). At ages 13 and 14, robbery was the least frequently committed offence ( $p < .001$ ). Frequency of robbery increased significantly between ages 13 and 15, where it peaked and, despite some slight decline, there was no significant reduction in frequency of robbery from age 15 to 17.

There were significant changes in the frequency of assault at every sweep. This increased from age 13 to peak at age 14, before declining to become the least frequent ( $p < .001$ ) form of violence amongst offenders from age 15 to 17. The trend in frequency of animal cruelty was very similar to that for assault, although the numbers were so small that some of the changes were not significant. There was a significant rise in frequency of animal abuse between age 13 and 15, before declining back to the same starting level by age 17 ( $p < .05$ ).

**Figure 5: Mean frequency of all forms of violence from sweep 2 to 6**

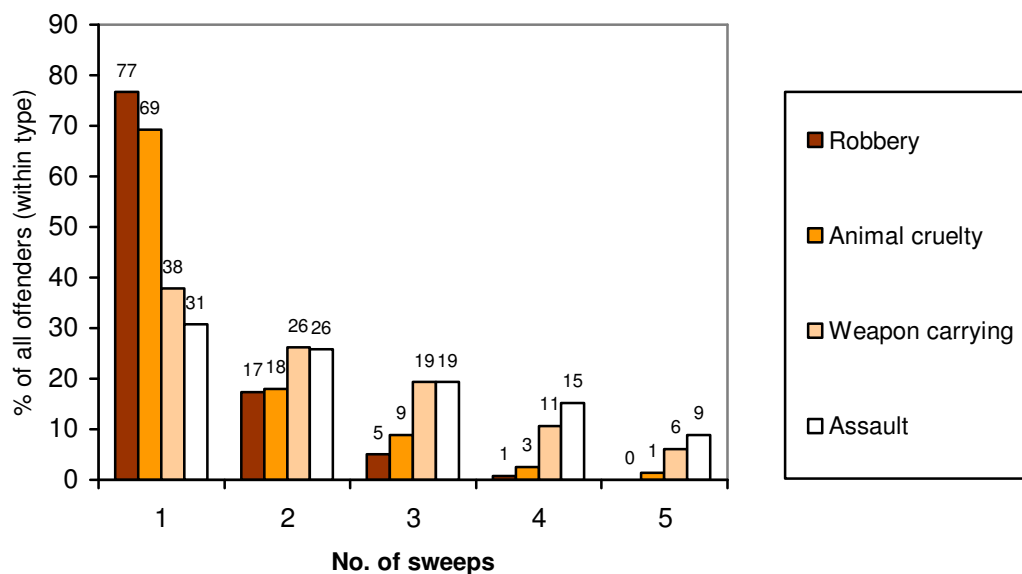


As discussed above, animal abusers were most likely to have offended at only one or two sweeps, with only 13% going on to offend over 3 sweeps or more. Similarly, figure 6 shows those involved in robbery were unlikely to have done so beyond one (77%) or two (17%) sweeps. Weapon carrying and assault were more likely to be carried out over a prolonged period of time, with over a third of such offenders reporting such behaviour at three or more sweeps of the survey.

The positive relationship between the number of sweeps at which offending was reported and the mean number of offences committed in total was common to all forms of violent offending. The average number of assaults committed by those who offended at only one sweep was 2.6 compared with 21.5 ( $p < .001$ ) for those who offended at all five sweeps (representing an average of 4.3 offences per sweep). Similarly, there was a significant ( $p < .001$ ) increase in weapon carrying amongst those who were involved over a larger number of sweeps, from a mean of 3.2 offences for those offending at only one sweep compared with 29.9 for those who offended at five sweeps (representing an average of 6.0 per sweep).

No cohort members reported committing robbery at all five sweeps, the highest being four. Even so, the total mean frequency of offending amongst these individuals (22.0) was significantly ( $p < .001$ ) greater than those who did so at only one sweep (3.5), with the average number offences for those offending at all four sweeps being 5.5.

**Figure 6: Number of sweeps at which violent offending reported, by offence type**



For the purposes of subsequent analysis, the categories of robbery, weapon carrying and assault have been grouped together to form one overall category of ‘other violent offences’.

## Comparison with other forms of non-violent offending

Edinburgh Study cohort members were questioned about a wide range of other forms of non-violent offending, ranging in seriousness from not paying the correct fare on the bus or train through to breaking into a house or building to steal something. The list of questions on offending used at each sweep was not always the same, as the questionnaire evolved over time. For the purposes of analysis here, only those items that were consistently used over the 5 sweeps will be analysed. This includes six items, which are described more fully in the panel below:

### *Non-violent questionnaire items used at sweeps 2 to 6*

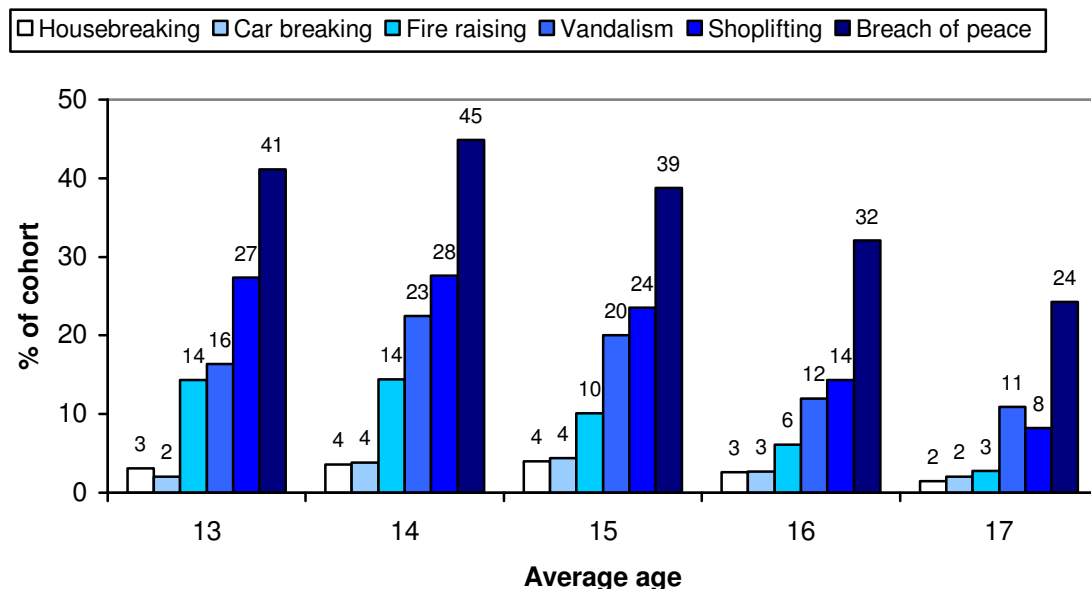
During the last year, did you/were you...

- ‘Break into a house or building to try and steal something’ (housebreaking\*).
- ‘Damage or destroy property that did not belong to you on purpose (e.g windows, cars or street lights)’ (vandalism).
- ‘Break into a car or van to try and steal something out of it’ (car breaking).
- ‘Steal something from a shop or store’ (shoplifting).
- ‘Set fire or try to set fire to something on purpose (e.g. a school, bus shelter, house, etc)’ (fire raising\*).
- ‘Loud, rowdy or unruly in a public place so that people complained or you got into trouble’ (breach of the peace\*).

\* Differences exist between the Scottish and English legal systems in the definitions and terminology of some types of offending. The Scottish terms of housebreaking and fire raising are used in this report, rather than the English terms of burglary and arson. The nearest English equivalent to the term ‘breach of the peace’ would be disorderly conduct.

The prevalence of each of these six forms of non-violent offending is shown in figure 7. Generally speaking, there is an inverse relationship between prevalence (that is now many individuals were involved in these types of offending) and the relative seriousness of the offending type. For example, behaving noisily or rowdily in public was most common, while stealing from cars and houses was least common. Comparing these percentages with figure 1, above, it is evident that most forms of non-violent offending were far more prevalent than animal cruelty. The exceptions to this were housebreaking and car breaking, which were less prevalent ( $p < .001$ ) than animal cruelty at every sweep. If we take the stance that breaking into cars and houses are at the more serious end of the offending continuum, we can conclude that – in terms of prevalence rates at least – animal cruelty is on a par with such serious forms of behaviour.

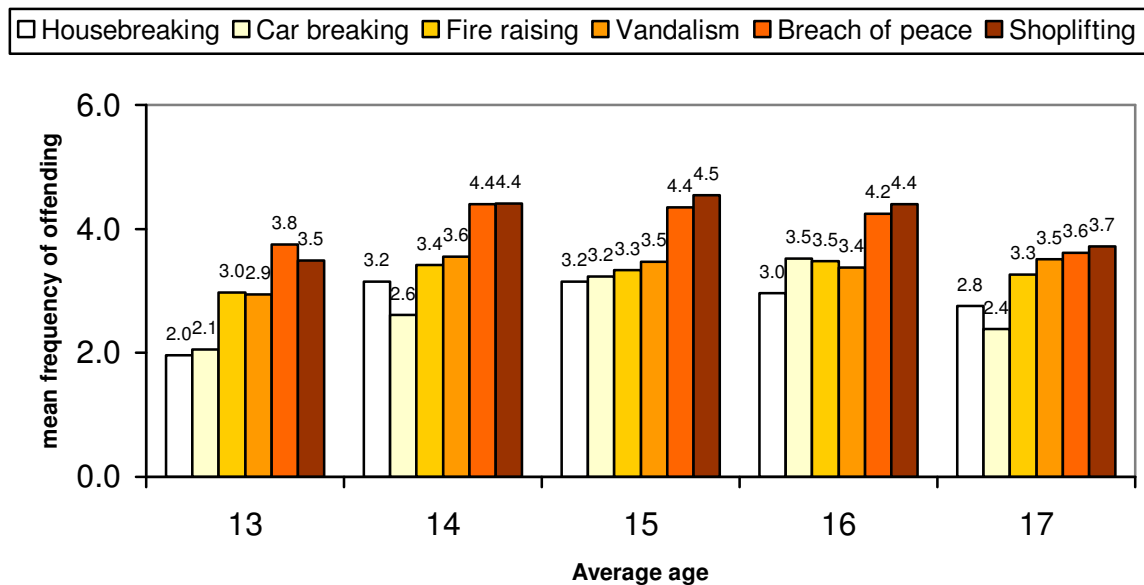
**Figure 7: Prevalence of non-violent crimes from sweep 2 to 6, by offence type**



To a large extent, this inverse relationship between prevalence of non-violent offences and seriousness was also mirrored in the figures for frequency of offending over the previous year. Figure 8 shows the average number of offences reported by offenders within each of the six non-violent offence types. Like the prevalence figures, the mean frequency of shoplifting and breach of the peace was consistently higher (at least  $p < .05$ ) than for the other forms of non-violent offending. While, at the other end of the scale, housebreaking and car breaking were almost always lowest in terms of mean frequency than the other forms of offending.

Interestingly, although animal cruelty was ranked alongside the more serious forms of non-violent crime in terms of prevalence, it had more in common with the middle range and lower end forms of non-violent behaviour that were less serious in terms of frequency. If the mean frequency of animal abuse (shown in figure 5) is compared with figure 8, at ages 13, 16 and 17 animal abuse is most similar to fire-raising and vandalism, while during the peak years of frequency (at ages 14 and 15) it is most similar to breach of the peace and shoplifting.

**Figure 8: Mean frequency of all forms of non-violent crime from sweep 2 to 6**



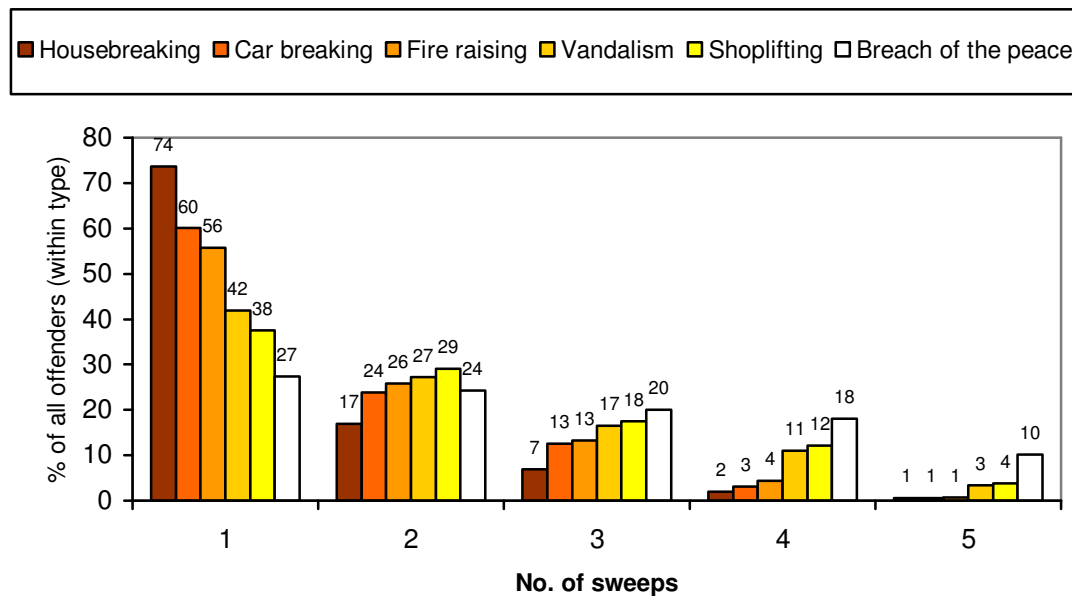
There was some variation between non-violent offence types in terms of the number of sweeps at which individuals had done these things, which also seemed to be related to seriousness of offending. Figure 9, reveals that the majority of offenders who committed housebreaking, car breaking and fire raising offended at only one sweep (74%, 60% and 56% respectively). These offenders were most similar to the animal abusers, 69% of whom offended at one sweep. Whereas, those who committed less serious forms of offending, namely vandalism, shoplifting or breach of the peace, were less likely to have done so at just one sweep (42%, 38% and 27% respectively). Concomitantly, the more serious offences were less likely to have been committed over a period of three or more sweeps; with less than 1 in 10 (9%) housebreakers and fewer than 1 in 5 car breakers (16%) and fire raisers (18%) having done so. This contrasts with the less serious non-violent offences of vandalism, shoplifting and breach of the peace which were more likely to have been carried out over 3 or more sweeps (31%, 33% and 48%, respectively).

As with animal abuse and other forms of violence, there was a positive relationship between the number of sweeps at which offending was committed and the mean number of offences reported in total for all forms of non-violent offending. The mean number of offences committed by those who offended at only one sweep was between 2.3 and 2.7 for all six forms of non-violent offending, whilst the mean frequency for those who offended at all five sweeps was significantly higher ( $p < .001$ ) for all offence types, ranging from 23.6 for vandalism to 34.0 for housebreaking.

For the purposes of subsequent analysis, the six non-violent offence types are grouped together to form one overall category of 'non-violent offences'.



**Figure 9: Number of sweeps at which non-violent offending reported, by offence type**



## Summary of section one

A very small proportion (less than one in twenty at any one sweep) of cohort members in the Edinburgh Study reported that they had harmed or injured an animal or bird at any of the five sweeps at which this question was asked. Amongst those who had abused an animal, the majority had done so only once or twice, although a substantial minority at each sweep reported doing this on a frequent basis. Over the course of the full five sweeps, 13% of the cohort stated that they had done this at least once. There was a positive relationship between the number of sweeps at which they reported animal abuse and the frequency of offending, which suggests that the longer young people are involved in this form of offending the greater the risk they pose to animals.

Animal abuse was far less prevalent than some other forms of violent offending, particularly interpersonal assault and carrying a weapon. However, there were similar trends in terms of frequency amongst offenders, particularly for animal abuse and assault which both increased in frequency from age 13 to 14 and gradually declined to almost the same level again by age 17.

In comparing animal abuse to other, non-violent, forms of offending, most similarity in prevalence terms was observed with the more serious forms of offending, such as breaking into property and motor vehicles. However, in frequency terms, animal abuse shared more in common with the middle range non-violent offences (such as fire-raising and vandalism) and the lower end offences (such as breach of the peace and shoplifting).

## SECTION 2: CHARACTERISTICS OF ANIMAL ABUSERS AND OTHER OFFENDER GROUPS

This section of the report presents a descriptive analysis of the characteristics of those young people who said they had harmed an animal or bird at any time during the five sweeps of the study at which such questions were asked. For ease of exposition, the cohort members have been grouped into four categories based on their behaviour across the sweeps: *animal abusers* (reported harming animals at any sweep), *violent offenders* (reported involvement in other types of violent behaviour at any sweep), *non-violent offenders* (reported involvement in some form of offending at any sweep, but not violence) and *non-offenders* (no reported offending behaviour at any sweep). By far the largest group (57%) of the cohort were the violent offenders, while roughly equal proportions were non-offenders (16%), non-violent offenders (14%) or animal abusers (13%) across the five sweeps.

Each of the four groups were compared on the basis of a broad range of variables that fall into several main domains, all of which have featured in theoretical analyses of offending behaviour generally. These domains were individual and family characteristics (gender, socio-economic status, personality, family structure and parental supervision); school factors (school sector, school attendance and commitment); peer related factors (peer influence and gang membership); environmental factors (neighbourhood deprivation and disorder); co-morbid behaviours (drug and alcohol use); and aspects of vulnerability (experience of victimisation and self harm). Analysis in this section includes data from sweep one of the study, although questions on animal abuse were not included at this sweep.

### Individual and family characteristics

#### *Gender and socio-economic status*

Table 1 shows the proportion within each group who were male, and displays a distinct gender difference between the four groups. Four out of five (79%) animal abusers were male, which is significantly higher than any of the other groups. Offenders involved in other types of violence were also more likely to be male (54%), although to a far lesser extent than animal abusers. Those who refrained from any offending and from violent offending were far more likely to be female, and there was no significant gender difference between these groups.

This table also shows the proportion of each group who were classed as being in a lower socio-economic group according to the occupation of their main parent or carer (low SES represents categories V, IV and lower III; see appendix A for details). These findings are interesting as they show that animal abusers are very similar in profile to non-offenders and non-violent offenders (there was no significant difference between them), whereas other violent offenders are far more likely ( $p < .001$ ) than any of these other groups to come from a family with a low socio-economic status.

**Table 1: Gender and socio-economic status of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% male	31	27	54	79
	ns		***	***
% low socio-economic status	32	35	51	41
	ns		***	***

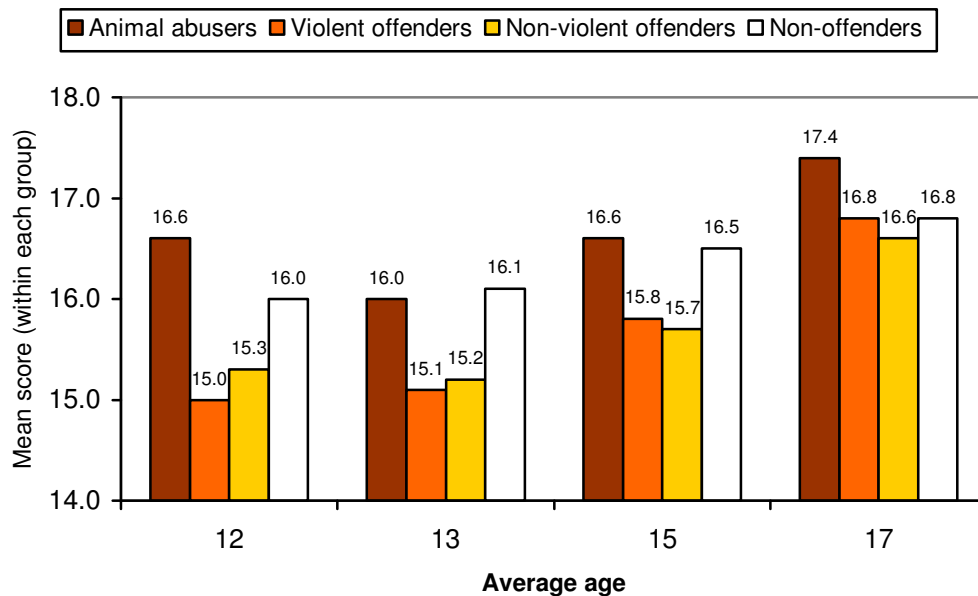
### *Personality measures*

Shortened scales for three personality measures were included in the self-report questionnaire at regular intervals: self-esteem, alienation (feelings of social isolation) and impulsivity (lack of self control) (see appendix A for further details).<sup>4</sup> The measure of self-esteem included questions such as ‘I like myself’ and ‘I often wish I was someone else’; the measure of alienation included items such as ‘lots of people try to push me around’ and ‘my friends often say or do things behind my back’; and the measure of impulsivity was based on questions such as ‘I get into trouble because I do things without thinking’ and ‘I get involved in things that I later wish I could get out of’. A scale was constructed for each bank of questions, ranging from 0 (indicating low self esteem, alienation and impulsivity) through to 24 (for those with high self esteem, alienation and impulsivity).

Figure 10 compares each of the four offender groups on the basis of their mean scores for self-esteem at the four sweeps at which it was measured. Overall, self esteem scores increased for everyone over these six sweeps, although the group with the most dramatic increase in self-esteem was the animal abusers. From age 12 to 15, the non-offenders and the animal abusers had almost identical self-esteem scores, while those involved in other types of offending (whether violent or not) were significantly lower ( $p<.01$ ). However, at age 17, the self esteem score for the animal abusers was far higher ( $p<.05$ ) than any of the other groups, each of which showed similar results ( $p>.05$ ).

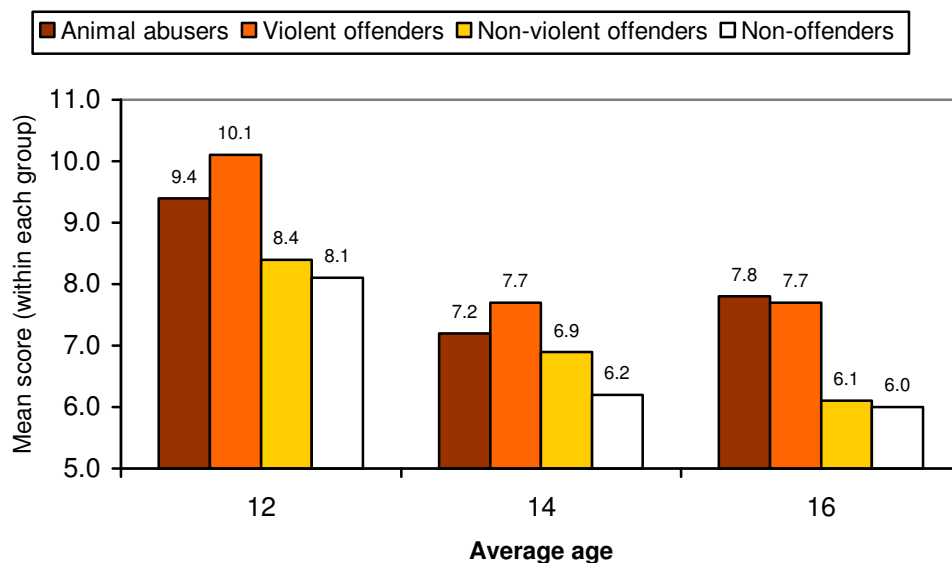
<sup>4</sup> Self esteem was measured at sweeps 1, 2, 4 and 6; alienation and impulsivity were measured at sweeps 1, 3 and 5.

**Figure 10: Average self esteem scores for animal abusers, compared with other offender groups, by sweep**



Feelings of alienation became far less prevalent between age 12 and 16 for the cohort as a whole. However, those involved in animal abuse and other types of violent behaviour were consistently more likely ( $p < .05$ ) to report feelings of alienation than the non-violent offenders and non-offenders at all three time points. There was no significant difference ( $p > .05$ ) between the animal abusers and other violent offenders on the measure of alienation at any sweep.

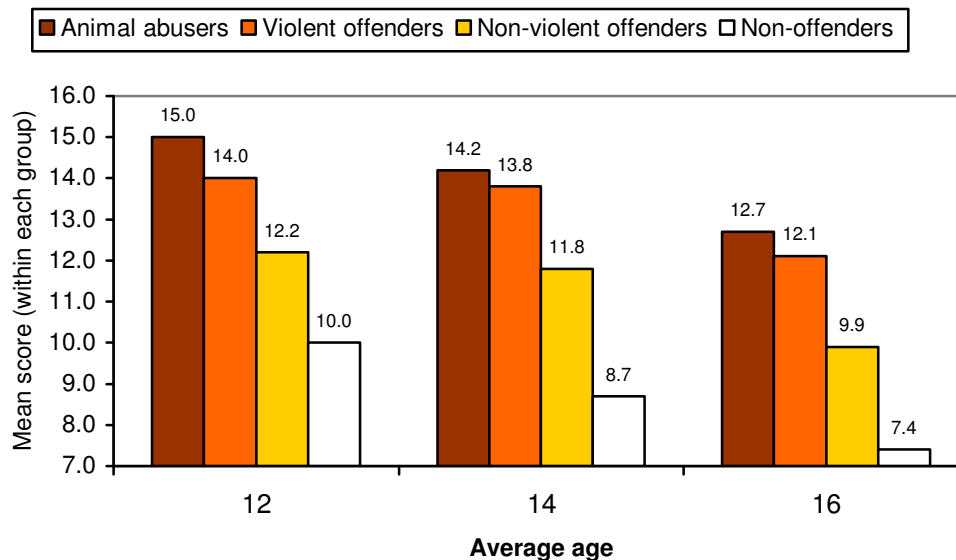
**Figure 11: Average alienation scores for animal abusers, compared with other offender groups, by sweep**



Impulsivity is an aspect of juvenile personality that has been frequently linked to delinquent behaviour and, particularly, violent behaviour (Farrington 2002). As with the other personality measures, there was generally a positive shift in people's

perceptions of their self control between sweeps 1 and 5. Figure 12 shows that there was a reduction in levels of impulsivity across all four groups, although this was most distinct amongst the non-offenders. Animal abusers scored highest on the measure of impulsivity at all three sweeps, and were significantly higher than the violent offenders at age 12 ( $p<.001$ ) and age 16 ( $p<.05$ ).

**Figure 12: Average impulsivity scores for animal abusers, compared with other offender groups, by sweep**



### *Family structure*

Family structure remained fairly stable over time for the majority of cohort members, although for some there were changes in terms of who they lived with. Analysis here focuses on the parental structure of the household over the period of the study, and simply examines the differences between the four offender groups in terms of whether they consistently lived with two parents (including step parents), lived with a single parent at some point or lived with some other adult carer at some point (see appendix A).

Table 2 shows that there was a significant divergence in family structure between those who had engaged in any kind of violence and those who had not. Both the violent offenders and animal abusers were significantly ( $p<.001$ ) more likely to have lived in a single parent household or in a household where they were cared for by some other adult carer than either non-violent offenders or non-offenders. However, there was neither a significant difference in family structure between the animal abusers and the other violent offenders, nor between the non-offenders and non-violent offenders.

**Table 2: Family structure of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% living with two parents (including step parents) at all sweeps	72	68	55	58
% living with single parent at least one sweep	22	28	34	34
% living with other adult carer at least one sweep	6	4	11	8
	ns	***	ns	

Difference between groups is indicated by \*\*\* ( $p<.001$ ), \*\* ( $p<.01$ ), \* ( $p<.05$ ) and ns (not significant).

### *Parental supervision*

Cohort members were asked questions at sweeps 1 to 5 about the extent to which their parents monitored their social activities, such as where they were going, who they would be with and what time they would be coming home. A continuous measure of 'parental supervision' was constructed from these questions at each sweep with a scale ranging from 0, for those who were very poorly supervised, to 9, for those who were supervised very closely. In addition, at sweep 4 of the study, a survey of the main parent or care giver of cohort members was carried out in which exactly the same questions were asked. A similar continuous scale ranging from 0 to 9 was constructed based on the responses of the parents or carers. Table 3 presents the mean parental supervision scores for each of the four offender groups measured at sweep four of the study, as reported by both the cohort members and their parents.<sup>5</sup>

Overall, cohort members reported being supervised by their parents to a reasonably high degree. However, table 3 reveals distinct differences across the four groups of offenders, with non-offenders being the most highly supervised, followed by non-violent offenders, then violent offenders and with animal abusers being consistently the least well supervised. The parental supervision scores derived from the survey of parents and carers were higher ( $p<.001$ ) than those provided by cohort members across all four groups. Nevertheless, a similar pattern emerged with animal abusers receiving the lowest parental supervision score and non-offenders the highest. Although, whereas the difference between the supervision scores for violent offenders and animal abusers was significant ( $p<.001$ ) amongst cohort members, it was not significant for the parents' or carers' score. This indicates that offenders involved in these two forms of violence had a different individual perception of how well they were supervised, but their parents' views were very similar.

<sup>5</sup> The parental supervision scores (derived from the self report questionnaires) measured at the other sweeps varied slightly across time, although the trend was identical at all sweeps.

**Table 3: Mean parental supervision score of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
Mean supervision score at age 15 – cohort members	7.4	6.3	6.0	5.4
	***		**	***
Mean supervision score at age 15 - parents	8.1	7.9	7.4	7.2
	*		***	ns

Notes: parental supervision score ranges from 0 (poorly supervised) to 9 (highly supervised). Difference between groups is indicated by \*\*\* (p<.001), \*\* (p<.01), \* (p<.05) and ns (not significant).

## School factors

### *School sector*

The Edinburgh Study included the full range of school sectors available within the city, including mainstream state sector schools, privately funded independent schools and state funded schools for children with special educational needs. As indicated in the introduction to this report, three independent schools were excluded from the analysis because a significantly higher proportion of young people at these schools reported ‘harming or injuring an animal or bird’. Although children were verbally instructed not to include legitimate fishing or hunting activities, there was concern that within these independent sector schools (which included many pupils from rural areas) such activities may have been reported.

Table 4 shows that the vast majority of cohort members were attending mainstream schools throughout their school career; however, violent offenders and animal abusers were less likely than the others to have attended independent school, and they were marginally more likely to have attended special schools. There was a difference between the violent and non-violent offenders in terms of their school profile, but no difference between the violent offenders and animal abusers.

**Table 4: School background of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% attended mainstream school (always)	79	84	86	86
% attended independent school (ever)	19	14	10	11
% attended special school (ever)	2	2	4	3
	ns		***	ns

Difference between groups is indicated by \*\*\* (p<.001), \*\* (p<.01), \* (p<.05) and ns (not significant). Percentages may not total 100 due to rounding.

### *School attendance*

Cohort members were asked about truanting from school at all six sweeps of the study, although sizeable numbers left school at the minimum school leaving age of 16 which reduces the usefulness of truancy figures after this point. Table 5 shows the proportion of each offender group who reported truanting from school at least once up to the end of sweep four (when the cohort had reached the average age of 16) and the average number of times they reported truanting during this period. Also shown here is the proportion of each group who left school at the earliest possible opportunity, at or before the age of 16.

There was no significant difference between the violent offenders and the animal abusers in terms of their likelihood to have truanted during the first four years of secondary school, their average frequency of truancy or their likelihood to leave school at the earliest opportunity. However, these two groups were far more likely to have had poor school attendance than the non-violent offenders and, even more so, the non-offenders. Almost three quarters of animal abusers had truanted from school during their first four years of secondary education, compared to less than one in five non-offenders.

**Table 5: School attendance of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% reported truancy at least once up to age 15	18	46	69	72
	***	***	ns	
Average number of times truanted from school up to age 15	0.6	2.6	6.3	7.0
	***	***	ns	
% left school at earliest opportunity	10	16	35	34
	**	***	ns	

Note: Difference between groups is indicated by \*\*\* (p<.001), \*\* (p<.01), \* (p<.05) and ns (not significant).

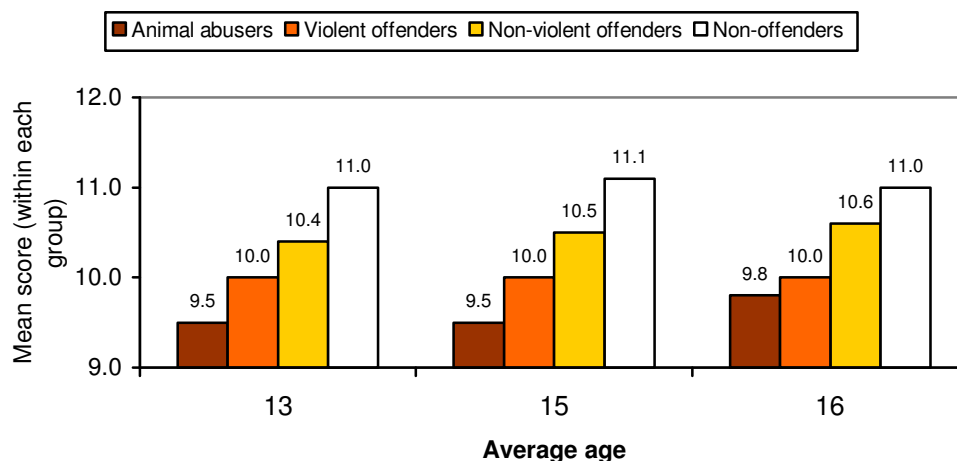
### *School commitment*

All cohort members were asked how much they agreed or disagreed with three statements about school, at age 13, 15 and 16, in order to gauge their level of commitment to secondary education. These statements were ‘school is a waste of time’, ‘working hard at school is important’ and ‘school will help me to get a good job’. Respondents were asked whether they agreed (a lot or a bit) or disagreed (a lot or a bit) with each statement. Their responses to each of the statements were combined to create a scale ranging from 0 to 12, where 0 represented very low and 12 indicated very high commitment to school.



Figure 13 reveals that animal abusers displayed the lowest levels of commitment to school at all three sweeps. At ages 13 and 15, animal abusers were significantly ( $p<.001$ ) less committed to school than other types of violent offenders, although the gap between these two groups closed at age 16, as there was no significant difference between them by this point. Non-violent offenders were considerably ( $p<.001$ ) more committed to secondary education than their violent counterparts at all three sweeps, whilst non-offenders were the most positive about school overall.

**Figure 13: Average school commitment scores for animal abusers, compared with other offender groups, by sweep**



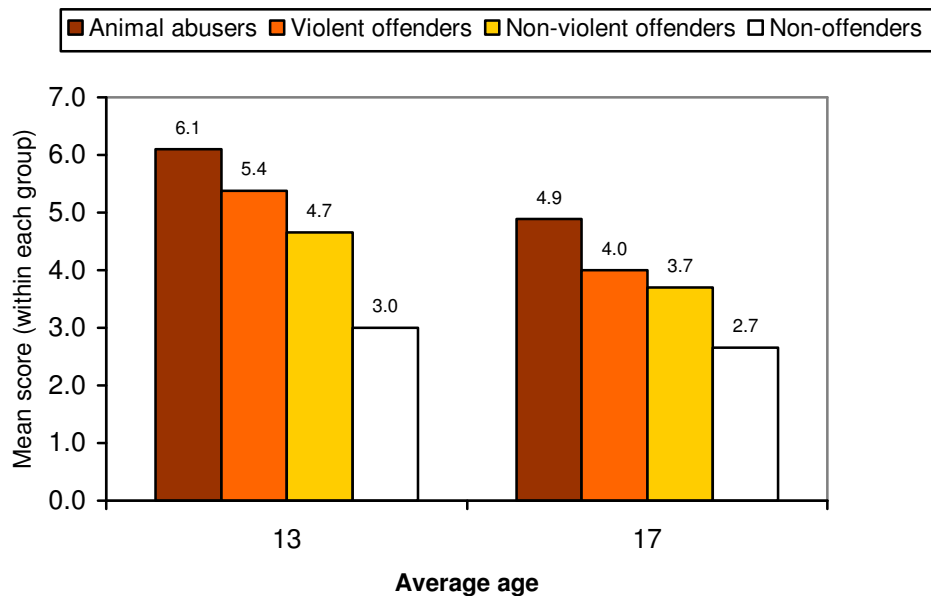
## Peer related factors

### *Peer influence*

A number of different questions were asked of cohort members about their friendship groups, including a series of questions at ages 13 and 17 aimed at gauging the influence of friends on individual behaviour. Five questions were asked about how likely they would be to ‘do what your friends said’ if the action involved overstepping a moral or legal boundary, and to ‘stay with your friends’ if the friend was getting them into trouble with various adults (see appendix A for details). From these five items a continuous scale was constructed ranging from a score of 0 for those who were not likely to be influenced and 15 for those who were highly likely to be influenced by their friends.

Figure 14, below, presents the average scores for each of the four groups on this measure of peer influence. Overall, there is a clearly declining trend in peer influence between the two age points which appears to have an effect across the board. However, a familiar pattern of divergence between the groups is also evident. Animal abusers were significantly ( $p<.001$ ) more likely to report being influenced by their friends than any of the other groups, both at age 13 and at age 17. Each of the other groups was also significantly (at least  $p<.01$ ) different from each other, with peer influence being least important amongst those who were non-offenders.

**Figure 14: Average peer influence scores for animal abusers, compared with other offender groups, by sweep**



### *Gang membership*

Cohort members were asked a variety of questions about gang membership at ages 13, 16 and 17. No definition of the term ‘gang’ was offered, so it is possible that cohort members interpreted this in different ways. In addition, the questions at age 17 were slightly different to those asked at previous sweeps. However, analysis of all three sweeps is presented in table 6. Perceived gang membership declined acutely between age 13 and 17 amongst the cohort as a whole, which is perhaps reflective of the higher level of maturity amongst cohort members by this age. Nevertheless, a greater proportion of animal abusers reported belonging to a gang than any of the other three offender groups. Animal abusers were more likely to report being in a gang at ages 13 and 17 than the other violent offenders, although there was no significant difference at age 16. However, there was a much more significant ( $p<.001$ ) gap between the violent and non-violent offenders, with prevalence of gang membership being at least twice as high for the violent offenders.

**Table 6: School attendance of animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% reported being in a gang at age 13	6	12	24	31
	***	***	**	
% reported being in a gang at age 16	3	5	17	20
	*	***	ns	
% reported gang membership ‘in last year’ at age 17	1	2	7	11
	*	***	*	

Note: Difference between groups is indicated by \*\*\* ( $p<.001$ ), \*\* ( $p<.01$ ), \* ( $p<.05$ ) and ns (not significant).

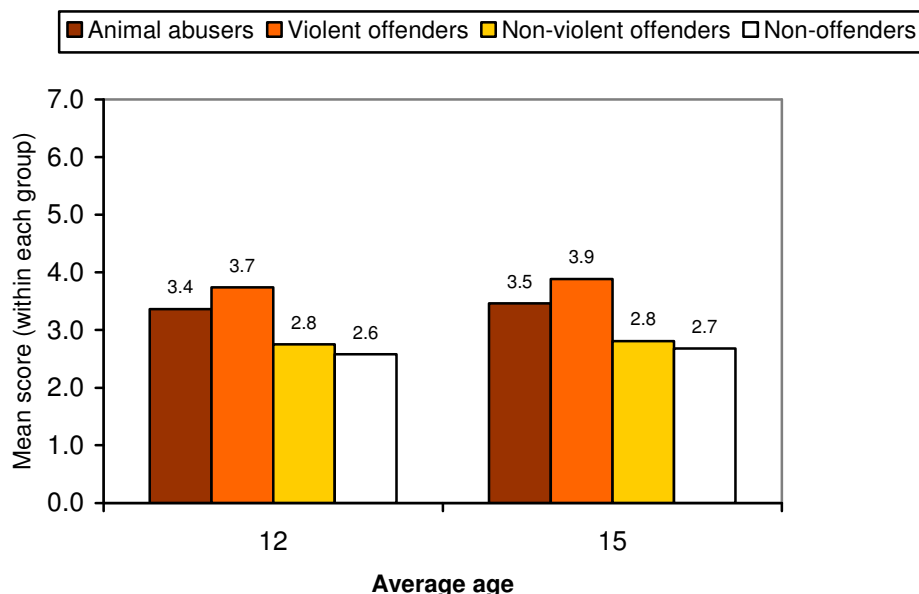
## Neighbourhood factors

### *Neighbourhood deprivation*

The environmental conditions within which a person lives have long been linked to different forms of offending behaviour, through a range of theories (see Bottoms and Wiles 2002 for a review). Since one of the aims of the Edinburgh Study was to review the impact of neighbourhood on individual offending, postcode information was collected about the cohort members at age 12, and thereafter at ages 15, 16 and 17. Six census measures were used to construct a measure of deprivation (see appendix A for details), which ranged from 0 (for the least deprived neighbourhoods) to 14 (for the most deprived). Figure 15 displays the average neighbourhood deprivation scores for those young people within each of the four groups under study in this section of the report at ages 12 and 15.

There were no differences at either of the two periods of data collection between the non-offenders and the non-violent offenders in terms of the average score for neighbourhood deprivation. However, figure 15 indicates that the levels of deprivation within the residential neighbourhoods of those involved in animal abuse and other forms of violent behaviour were significantly higher (at least  $p < .01$ ) at both sweeps. Interestingly, however, the other violent offenders were likely to be living in slightly more deprived neighbourhoods than the animal abusers at both age points ( $p < .05$ ).

**Figure 15: Average neighbourhood deprivations scores for animal abusers, compared with other offender groups, at sweeps 1 and 4**

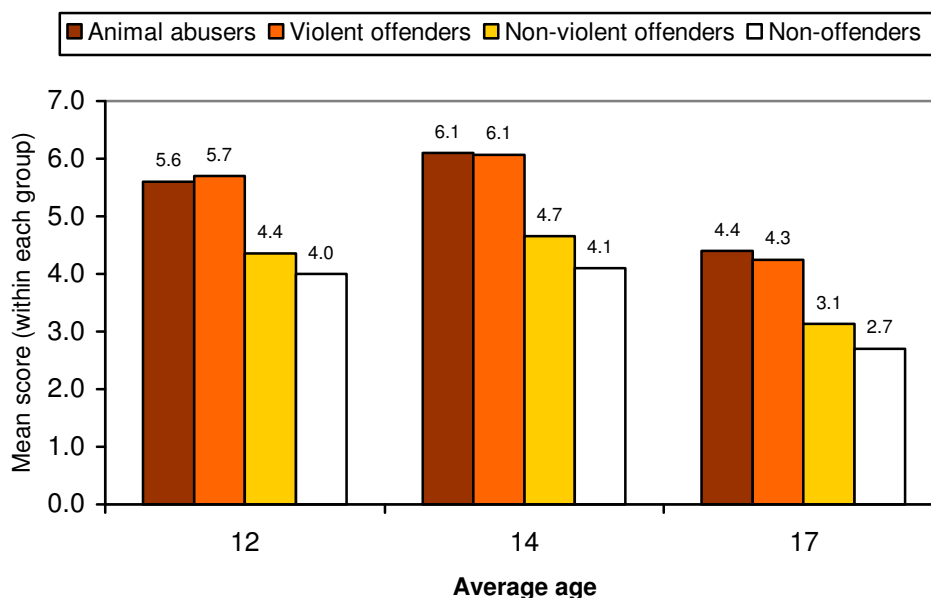


### *Neighbourhood disorder*

The physical condition of young people's neighbourhoods was ascertained using a series of questions about how much of a problem various aspects of disorder or incivilities were in the local area where the child lived. A total of 11 items were

included in the self-report questionnaires at ages 12, 14 and 17, which allowed a comparable scale ranging from 0 for those living in areas with no observable incivilities to 22 for those living in very disordered neighbourhoods (see Appendix A for details). Figure 16 reveals a familiar picture to neighbourhood deprivation in terms of the ordering of the groups, with the violent offenders (animal abusers and non-abusers) reporting a higher level of disorder within their local neighbourhoods, on average. In fact, there was no significant difference between these two groups of violent offender for this measure. Similarly, there was little or no difference between the non-violent offenders and non-offenders, although there was a considerable gap between the violent and non-violent cohort members at all three sweeps.

**Figure 16: Average neighbourhood disorder scores for animal abusers, compared with other offender groups, by sweep**



## Drug and alcohol use

Information was collected from cohort members at each sweep about their alcohol consumption and drug use. Although it is not possible to determine whether these were directly related to involvement in offending behaviour, level of substance use nevertheless provides a useful indicator of co-morbidity amongst offenders. The measures of substance use reported here are ‘weekly alcohol use’ and ‘drug use in the last year’. Overall, six in ten (59%) cohort members reported drinking alcohol at least once a week over the course of the six sweeps, whilst half (52%) stated that they had used drugs at least once. However, the prevalence of drug and alcohol use varied widely by offender group, as shown in table 7. Four out of five (79%) animal abusers reported drinking alcohol weekly at some point and the average number of sweeps at which they had done so was 1.8. This was significantly higher than the other types of violent offender, who in turn were more likely to drink alcohol weekly than the non-violent offenders and non-offenders. A similar pattern emerged with the findings on drug use. Seven out of ten (73%) animal abusers reported taking an illegal drug at least once, and the average number of sweeps at which they had done so was 1.8. This was significantly greater than for any of the other groups.

**Table 7: Drug and alcohol use amongst animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% who reported drinking alcohol weekly at any sweep	32	60	69	79
	***		***	***
Mean number of sweeps at which weekly drinking reported	0.5	1.1	1.5	1.8
	***		***	***
% who reported taking a drug at any sweep	20	46	61	73
	***		***	***
Mean number of sweeps at which drug use reported	0.3	1.0	1.5	2.0
	***		***	***

Note: Difference between groups is indicated by \*\*\* (p<.001), \*\* (p<.01), \* (p<.05) and ns (not significant).

## Victimisation and self harm

Previous analysis of data on animal abusers (McVie 2005) suggested that as well as being problematic in terms of their behaviour, they were also a particularly vulnerable and risk-prone group. Other research has indicated links between animal abuse and experience of child abuse or neglect (Ascione and Arkow 1999; Baldry 2006), although this cannot be established using Edinburgh Study data since cohort members were not asked about these issues.<sup>6</sup> Nevertheless, cohort members were asked about their experience of five types of victimisation, including being a victim of theft, violence and robbery (see appendix A for more details). They were also separately asked about their experience of bullying (see Appendix A). In addition, data were collected from the records of the Scottish Children's Reporter Administration (SCRA) which included details of referrals made to the Reporter on the grounds of child abuse, neglect or lack of parental care.<sup>7</sup> To further explore this avenue of vulnerability, data on the prevalence of deliberate self-harm (included in the questionnaire from sweep 3 onwards) were also analysed. Table 8 indicates the level of victimisation experienced by young people, both according to their own self reports and from the records of the SCRA, and their reports of self-harm.<sup>8</sup>

<sup>6</sup> For child protection reasons it was not feasible to include questions on child abuse or neglect in early sweeps of the study. It is planned that retrospective questions will be included in the next phase of the study (sweep 7) to be carried out in early 2008.

<sup>7</sup> SCRA is the national body responsible for addressing the needs and behaviour of children and young people in Scotland who are facing serious problems in their lives. Referrals can be made by any person and on a wide range of grounds, including child abuse or neglect, lack of parental care, committing an offence and failure to attend school. Further information about the system can be found at [www.scra.gov.uk](http://www.scra.gov.uk).

<sup>8</sup> Analysis of SCRA records includes those referred on grounds c (lack of parental control) and d (victim of a schedule 1 offence).

**Table 8: Experience of victimisation amongst animal abusers compared with other groups of offenders and non-offenders**

	Non-offenders (n=1087)	Non-violent offenders (n=582)	Violent offenders (n=2357)	Animal abusers (n=571)
% who reported being a victim of crime at any sweep (1-6)	69	83	93	98
	***		***	***
Mean number of sweeps at which victimisation reported	1.3	1.9	3.0	3.5
	***		***	***
% who reported being a victim of bullying at any sweep (2-5)	67	68	74	70
	ns		**	*
% who were reported to SCRA on grounds of abuse, neglect or lack of care	4	5	11	10
	ns		***	ns
% who reported deliberately self harming at any sweep (3-6)	23	31	42	49
	***		***	**
% who reported ever trying to end their life (sweep 6 only)	4	5	8	7
	ns		*	ns

Note: Difference between groups is indicated by \*\*\* (p<.001), \*\* (p<.01), \* (p<.05) and ns (not significant).

Experience of some kind of victimisation, as reported by the cohort members themselves over the six sweeps, was high. Even amongst the non-offenders, seven in ten (69%) said they had been victimised at least once. Nevertheless, the prevalence of victimisation amongst the animal abusers was far higher, with almost all of these individuals (98%) saying they had suffered being a victim of crime at some point over the six sweeps. In addition, the animal abusers reported experiencing victimisation at an average of 3.5 sweeps compared with only 1.3 for the non-offenders. The differences in self-report victimisation between all the groups were highly significant. Those who were involved in violent offending were also more likely to report having been bullied than those who were not involved in violent behaviour; although, animal abusers were slightly less likely to report being bullied than the other violent offenders.

Turning to the official records, one in ten (10%) cohort members had been referred to the Childrens' Reporter on grounds of abuse, neglect or lack of care at some point. Animal abusers were no more likely to have had such a referral than the violent offenders, but both of these groups were more likely to have been referred than the non-offenders and the non-violent offenders. Other analysis carried out on referrals to the children's hearing system has indicated that certain types of offender (predominantly males from disadvantaged backgrounds) are more likely to be referred, and this would fit with earlier findings in this descriptive section of the report (see McAra and McVie 2005).

Overall, 36% of the cohort reported that they had deliberately harmed themselves in some way between age 14 and 17. However, there were big differences between the four offender groups. Animal abusers were the most likely to report self-harming, with half of them having done so. A high proportion of violent offenders (42%) had also self-harmed, and they were more likely to have done so than non-violent

offenders (31%). At sweep six, cohort members were asked 'have you ever hurt yourself on purpose in an attempt to end your life'. A small, but worrying, proportion of the cohort (7%) had done so and, as is evident from table 8, those young people who were involved in some kind of violent behaviour were more likely to have attempted suicide than those who were non-violent. There was no significant difference on this measure between the animal abusers and the other violent offenders, however.

## **Summary of section two**

Comparative analysis of four groups of cohort members, on a range of different characteristics and behaviours, reveals some stark differences between different types of offenders and non-offenders between the ages of 13 and 17. There was rather little difference between non-offenders and non-violent offenders on many of the variables studied; however, these two groups were significantly different from animal abusers and other violent offenders on every single measure. Overall, the violent offenders and animal abusers presented as being far more problematic, risk prone, vulnerable and deprived than the other groups.

Those who had reported involvement in animal abuse were very similar to the other violent offenders on a range of different measures. They were similarly likely to report feeling alienated by their peers and to have made suicide attempts in the past; they were equally likely to live with a lone parent or another carer, rather than with two parents, and their parents reported supervising them to a similarly poor extent; they had similar patterns of school truancy and were equally likely to have left school as early as possible; they lived in areas that were similarly deprived and disordered; and they were as likely as each other to have been referred to the Children's Reporter during childhood.

However, the animal abusers did present as being significantly different to the other violent offenders on a number of other measures. Animal abusers were more likely to be male; to live in a higher socio-economic status household; they reported higher levels of impulsivity, but also self-esteem; they perceived themselves to be less well supervised by their parents (despite the similarity in parents' reports) than other violent offenders. Animal abusers reported lower levels of commitment to school, they were more influenced by their peers and more likely to be gang members than other violent offenders. They were more likely to be weekly drinkers and/or drug users, and to do so more frequently. However, they were also more highly victimised and to have deliberately self harmed, although they were less likely than the other violent offenders to have been bullied.

## SECTION 3: TRAJECTORIES OF ANIMAL ABUSE

### Background

In recent years, theorists exploring developmental criminology (Loeber & LeBlanc, 1990) and criminal careers (Blumstein, Cohen, Roth & Visher, 1986) have increasingly highlighted the importance of disentangling the various complex pathways of offending within offender populations. Theory suggests that, within each population, there are distinctive groups with distinctive aetiologies that follow distinctive trajectories of offending behaviour through the life course. Advances in statistical modelling approaches over the last decade have facilitated the development of new ways to explore taxonomic theories about offenders. Group based modelling permits the classification of offenders into distinctive groups on the basis of observed offending histories. Using inductive methods, offending trajectories can be identified on the basis of naturally occurring patterns of behaviour within groups (Nagin 1999, 2005).<sup>9</sup>

The analysis presented here is based on semi-parametric group-based modelling (SGM), which proposes that within any population different individuals will exhibit specific trajectories in terms of their behaviour (for a comprehensive review of SGM see Nagin 2005). SGM was carried out using ordinal measures of frequency of offending to identify distinct trajectories of animal abuse and interpersonal violence between the ages of 13 and 17.<sup>10</sup> Due to the sparse nature of the data for the animal abuse variable, trajectories were constructed using only those individuals who had reported offending in this way at any sweep (i.e. non-offenders were excluded from the trajectory modelling) which meant that dual trajectory modelling was not possible.<sup>11</sup> By exploring the relationships between the two sets of trajectories, it is possible to identify possible developmental linkages between the two forms of behaviour, however.

### Trajectory groups

SGM uses maximum likelihood probability to assign individuals to one trajectory group on the basis that their behavioural characteristics are homogenous with others in the same group. Diagnostics for model accuracy can then be used to identify the optimal number of trajectory groups for the data under investigation. Using the frequency measure for animal abuse, an optimal model containing five trajectory groups was constructed, as shown in figure 17.<sup>12</sup> On the basis of emerging offending

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<sup>9</sup> There are other approaches to developing offender taxonomies, such as *a priori* classification which is theoretically driven, although this has been criticised for being difficult to test in the real world and for potentially failing to detect some naturally occurring groups (Chung et al 2002).

<sup>10</sup> The analysis was conducted using M-Plus (Muthén and Muthén 2007). The ordinal measure of frequency of offending consisted of values 0, 1, 2, 3, 4, 5, 6 and 11 (where 6 and 11 were minimum values of the number of times offended). Nagin (1999) recommends the SAS add-on 'proc traj', but the same results can be obtained in M-Plus.

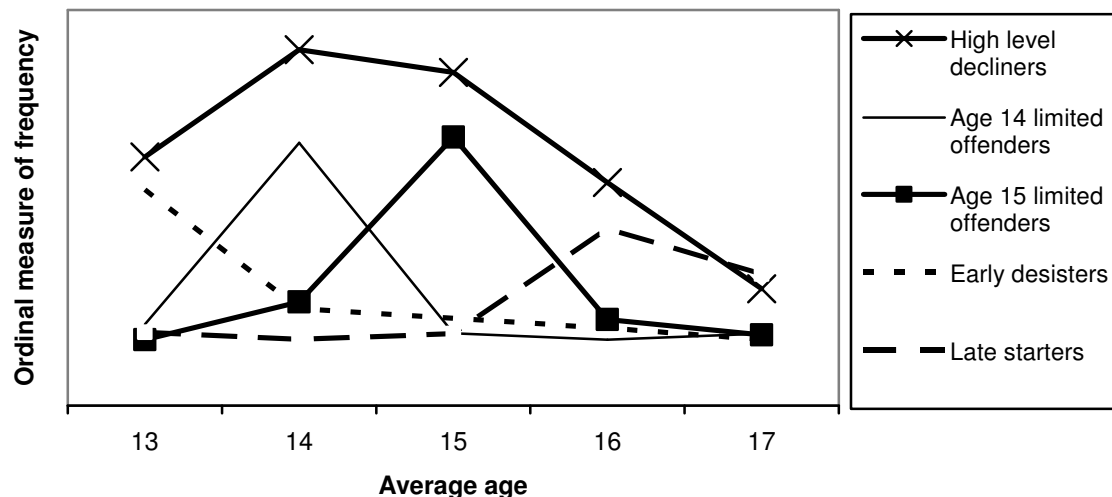
<sup>11</sup> Strictly speaking this method of trajectory modelling is incorrect, as all cases should be taken into account in determining probability of group membership. However, the relative rarity of animal abuse meant that the frequency data were over-whelmed by cases with a value of 'zero' which reduced the sensitivity of the modelling to the extent that possible groups are concealed.

<sup>12</sup> Appendix B contains a detailed discussion on the number of groups that were identified.



pathways, the groups were labelled ‘high level decliners’, ‘age 14 limited offenders’, ‘age 15 limited offenders’, ‘early desisters’ and ‘late starters’. There is no ‘non-offender’ group in this model because all non-offenders were excluded from the analysis (see footnote 11).

**Figure 17: Trajectory models of animal abuse from age 13 to 17**



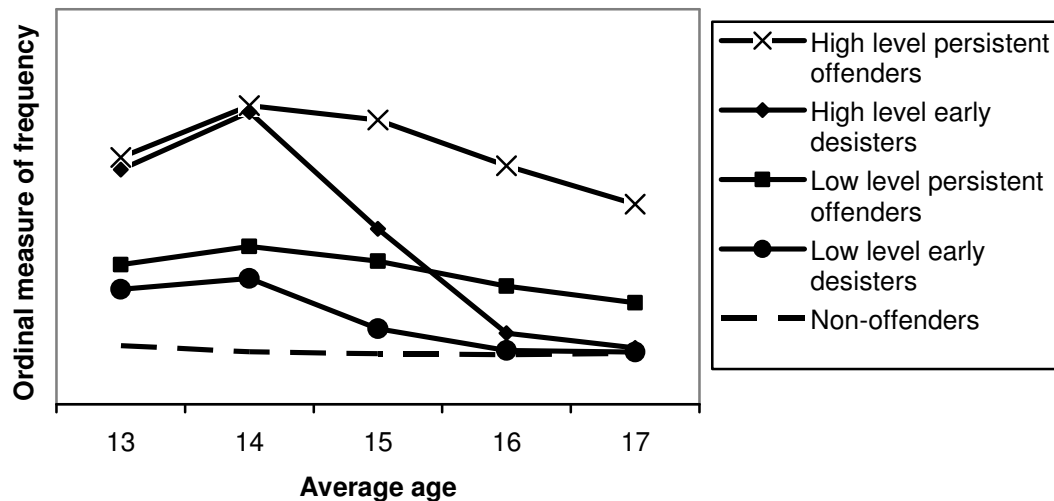
The largest group within the model was the early desisters (32%), who were involved in a moderate amount of offending at age 13 but this declined markedly at age 14 and by age 17 they had desisted completely. A further two groups of offenders showed a sharp peak in frequency of animal abuse at ages 14 (21%) and 15 (24%), but the offending of these two groups was short-lived and both groups had desisted by age 17. Data for earlier age points would clearly be desirable; however, it appears that each of these three groups followed an ‘adolescence limited’ offending trajectory which differed only in terms of the age at which their behaviour peaked.<sup>13</sup> A smaller group of late starters (13%) did not start offending until age 16 and, although they had not desisted by age 17, they seemed to be on a downward trajectory. The smallest group of all is the high level decliners, who comprised 9% of all animal abusers and were involved in the most frequent offending at each age point, except age 17 where the late starters were marginally higher. Nevertheless, even this group showed a distinct pattern of desistance between age 15 and 17.

The frequency measure of interpersonal assault also produced an optimal trajectory model containing five groups, which are shown in figure 18. On the basis of their developmental pathways, the five assault groups were labelled ‘non-offenders’, ‘low level early desisters’, ‘low level persistent offenders’, ‘high level early desisters’ and ‘high level persistent offenders’. Most cohort members (58%) were assigned to a group that denoted some level of involvement in offending; however, the largest single group was the non-offenders (42%). Just under a third (31%) of the cohort were classified as low level early desisters, who were infrequently involved in interpersonal violence at ages 13 and 14, before declining and desisting completely by age 17. A further 17% were classified as low level persistent offenders, as they were

<sup>13</sup> See Moffitt (1993) for a detailed description of the ‘adolescence limited’ versus ‘life course persistent’ offending typology.

relatively infrequent but persistent offenders between ages 13 and 17 (although there was a shallow pattern of decline after age 14). Five per cent of the cohort were labelled high level early desisters, as they were involved in frequent interpersonal violence at age 13 and 14, but then rapidly declined and had desisted by age 17 (showing a similar profile to the low level early desisters). The remaining 6% were high level persistent offenders who consistently reported being involved in frequent interpersonal violence, although here too there was evidence of a pattern of decline after age 14.

**Figure 18: Trajectory models of interpersonal violence from age 13 to 17**



The two trajectory models show little similarity with regards to the groups that emerged, but this is not unexpected since the samples underlying the trajectory models are different. The lack of overlap between the groups in these two models does not indicate that the developmental pathways of these forms of behaviour are dissimilar.

## Trajectory comparison

### *Cross-tabulation*

Using the most likely group assignment for each person (based on greatest probability), a simple cross-tabulation of the different offending groups can be carried out. Table 9 shows the percentage of animal abuse offenders and non-offenders who were assigned to each of the interpersonal assault groups. The first point to note is that almost half (46%) of those who had never been involved in animal abuse were categorised as non-offenders in terms of interpersonal assault. This compares with only 17% of those who had abused an animal. In addition, around a third of non-abusers had been involved in a low level of interpersonal violence before desisting at a relatively early stage. In other words, most young people who had not abused animals were also either non-violent towards people or had done so only infrequently and for a short period in early adolescence. Those who had not abused animals were equally likely to animal abusers to be low level early desisters from interpersonal violence; however animal abusers were around twice as likely as non-offenders to fall into the one of the three remaining categories of interpersonal violence. In fact, they were almost three times (13%) as likely as non-offenders (5%) to be high level

persistent violent offenders. The differences between the groups shown in table 9 are highly statistically significant ( $p < .01$ ).

**Table 9: Membership of interpersonal violence trajectory group amongst animal abuse offenders and non-offenders**

Interpersonal violence groups:	Percentage of animal abuse non-offenders (n=3666)	Percentage of animal abuse offenders (n=491)
Non-offenders (n=1709)	46	17
Low level early desisters (n=1242)	31	32
Low level persistent offenders (n=667)	15	29
High level early desisters (n=199)	4	9
High level persistent offenders (n=222)	5	13

Note: columns may not total 100 due to rounding.

Table 9 indicates that there is a positive relationship between involvement in animal abuse and involvement in other forms of interpersonal violence; however, the trajectory analysis produced distinctively different pathways for these two forms of violent behaviour. Therefore, table 10 looks at the percentage of people within each of the five animal abuse trajectory groups who fell into the five assault trajectory groups (based on probabilistic assignment to one group). The results give further evidence of a degree of developmental consistency between these two forms of violent behaviour.

Table 10 suggests little difference between the first three groups of animal abusers in terms of their profile of interpersonal violence. In fact, separate analysis of the early desisters and the age 14 and 15 limited offenders showed no significant difference between them. The majority (more than 60%) of these ‘adolescence limited’ animal abusers were classified as low level violent offenders, with most desisting from an early stage but a high proportion persisting in low level violence until age 17. Around 1 in 5 of the young people in each of these three animal abuser groups had been involved in high level interpersonal violence, although there was no consistency in terms of whether they were early desisters or high level persistent offenders. Generally speaking, ‘adolescence limited’ animal abuse was predominantly associated with no or low-level involvement in interpersonal violence, although the later their animal abuse peaked the more likely they were to be ‘persistent’ violent offenders.

The two smaller groups of animal abusers, the late starters and the high level decliners, present quite differently in table 10. A third of the late starting animal abusers (who did not begin until about age 16) were classified as non-offenders in terms of their involvement in interpersonal violence, which was significantly higher than for any other animal abuse offending group. Half of them were assigned to the low level violence groups, although they were slightly more likely to be persistent low level offenders than early desisters. The late starting animal abusers who were involved in high levels of interpersonal violence, they were far more likely to be persistent offenders than desisters. In summary, although a large proportion of late starters were non-violent, those who were involved in interpersonal violence were highly likely to be persistent offenders.

**Table 10: Membership of interpersonal violence trajectory group by animal abuse trajectory group**

Interpersonal violence groups:	Percentage in each animal abuse offending trajectory group (n=491)				
	Early desisters (n= 159)	Age 14 limited offenders (n=104)	Age 15 limited offenders (n=119)	Late starters (n=64)	High level decliners (n=45)
Non-offenders	18	16	12	33	7
Low level early desisters	35	34	35	23	20
Low level persistent offenders	26	29	35	27	24
High level early desisters	9	13	6	3	18
High level persistent offenders	11	9	12	14	31

Note: columns may not total 100 due to rounding.

A very small proportion (7%) of the high level decliners were involved in no violence towards people, whereas half (49%) of them were classified as involved in high level interpersonal violence. This group of animal abusers showed the greatest degree of behavioural consistency in respect of frequency of offending. Although the overall pattern amongst the high level animal abusers was one of decline (although not complete desistance by age 17), they were more likely to be persistent offenders (55%) in terms of interpersonal violence than desisters (38%). Although the comparisons shown in table 10 indicate a high degree of developmental consistency, it is clear that the relationship between animal abuse and interpersonal violence is not an entirely straightforward and predictable one.

### *Correlation analysis*

SGM assigns individuals a ‘probability’ that they will fall into each of the groups specified within the trajectory model. By correlating these probability scores, it is possible to identify the strength and direction of the relationship between groups in the animal abuse and assault trajectory models.<sup>14</sup> Table 11 presents a correlation matrix showing the spearman correlation scores for each of the five groups defined in the animal abuse model and the five groups defined in the assault model. The correlation scores are low (i.e. they are much closer to 0 than to 1) and few correlations reach a significance level of 95% or above, which indicates fairly weak co-variance. This means that the probability of belonging to one of the animal abuse trajectory groups does not co-vary in a simple linear way with the probability of belonging to an interpersonal violence trajectory groups. Nevertheless, some interesting findings emerge.

Table 11 shows that there is greater correlation between some trajectory group pairings than others, and differing directionality in the relationships. The strongest correlations were between high level animal abusers and high level persistent offenders (.251) and high level desisters (.196) in terms of interpersonal violence.

<sup>14</sup> Correlation scores can only be calculated for those who were involved in animal abuse, since the non-offenders were excluded from the trajectory analysis and therefore cannot have a probability score.

Correspondingly, high level animal abuse was negatively correlated with non-violence and low level early desistance from interpersonal violence. In other words, there is a high degree of behavioural consistency in terms of frequent offending for both forms of violence.

Despite the lack of significant difference between the three ‘adolescence limited’ groups in the cross-tabulation analysis, subtle differences do emerge in table 11. The probability of being an age 14 limited offender was positively correlated with non-offending and low level early desistance from interpersonal violence, and negatively correlated with being a high level persistent violent offender. The probability of animal abuse peaking at age 15 was positively correlated with low level persistent violence, although negatively correlated with high level offending. This supports the earlier observation that the later animal abuse peaks the more likely it is to be associated with persistent interpersonal violence, although it seems that this is true only in terms of low frequency violence.

The correlation scores for the late starting animal abusers were largely non-significant; however, late onset animal abuse was negatively correlated with both high and low level desistance from interpersonal violence (although the latter score was only significant at the 90% level). Although the frequency of offending amongst the late starters at age 17 was practically identical to that of the high level decliners, the correlation scores indicate that late starting animal abusers are more closely associated with non-violent and low level persistently violent offenders than high level persistent offenders. Early desistance from animal abuse was not significantly correlated with any of the violent trajectory groups at the 95% level, although the pattern clearly indicates that desistance from animal abuse was more likely to be associated with either non-violence or desistance from interpersonal violence, and negatively associated with persistent violence.

**Table 11: Correlation matrix for animal abuse and interpersonal violence trajectory groups**

Interpersonal violence groups:	Animal abuse groups				
	Early desisters (n= 159)	Age 14 limited offenders (n=104)	Age 15 limited offenders (n=119)	Late starters (n=64)	High level decliners (n=45)
Non-offenders	.053	.075*	.057	.065	-.184**
Low level early desisters	.061	.110**	.032	-.065	-.087*
Low level persistent offenders	-.063	-.014	.083*	.061	.055
High level early desisters	.042	.039	-.082*	-.158**	.196**
High level persistent offenders	-.042	-.082*	-.062	.001	.251**

Note: Strength of association between groups measured using Spearman Correlation is indicated by \*\* (p<.01) and \* (p<.05).

## Summary of section three

Semi-parametric group based modelling was carried out to identify behavioural trajectories for both animal abuse and interpersonal violence. Modelling identified five groups of offender for animal abuse (high level decliners, age 14 limited offenders, age 15 limited offenders, early desisters and late starters) and five groups for interpersonal violence (high level persistent offenders, high level early desisters, low level persistent offenders, low level early desisters and non-offenders). Cross-tabulation indicated that animal abusers were significantly different from non-offenders in terms of their involvement in interpersonal violence. Looking at the links between group membership for the two offence types, the three animal abuse groups who desisted at or prior to age 15 were most likely to be involved in low level interpersonal violence. Late onset animal abusers were most likely to be in the non-offender group for interpersonal violence; whereas, high level animal abusers were most highly represented amongst the high frequency violent offenders.

Correlating the membership probabilities for the different trajectories demonstrates some consistency in terms of the relationships between animal abuse and interpersonal violence. Generally speaking, there is a mutual increase in the frequency of involvement in one form of violence with the other, and this is especially pronounced in terms of those involved in high levels of offending. Desistance from animal abuse is associated with desistance from interpersonal violence (both high and low level), which indicates that for many young people involvement in animal abuse is a transient stage that forms part of a more general pattern of low level violence. Animal abuse that peaks later in adolescence is more closely associated with persistent low level violence, however, indicating that these offenders have a generally violent demeanour but involvement in animal abuse is only transitory. Late onset animal abuse is negatively associated with desistance from violence (especially at the high level), although it does not appear to be strongly associated with any of the other violent groups and may represent a distinct category of offender. However, involvement in persistent and frequent animal abuse is most closely associated with persistent and frequent interpersonal violence, and seems to be part of a more entrenched culture of adolescent violence.

## SECTION 4: MULTIVARIATE ANALYSIS OF ANIMAL ABUSE TRAJECTORY GROUPS

This phase of the analysis draws upon the previous stages to explore whether involvement in animal abuse can be predicted at an early age and whether characteristics measured in the early teens might usefully differentiate between different types of animal abuser to facilitate early prevention and intervention. In section 2 of this report, descriptive statistics were used to show that a broad range of characteristics, many of them measured at age 12 and 13, were related to involvement in animal abuse during adolescence. In section 3, distinct developmental trajectories of animal abuse were identified which differentiated between offenders in terms of their level of offending and their behavioural development. This section of the report aims to build on the earlier analysis to explore the relative importance of potential early explanatory variables in predicting young people's propensity to abuse animals and to be in one animal abuse trajectory group as opposed to the others. This will be done using multivariate modelling in which all of the explanatory factors are simultaneously controlled for.

### Regression modelling

Binary logistic regression was used to simultaneously model the effect of a wide range of potential explanatory variables on membership of different groups.<sup>15</sup> First, a model was constructed in which the animal abusers (i.e. anyone who had ever reported involvement in animal abuse) were compared against non-offenders. Thereafter, separate logistic regression models were constructed to compare each of the five animal abuse trajectory groups against the others, to determine whether there might be factors that distinguished each individual offender type from the rest.<sup>16</sup> In total, therefore, six binary logistic regression models created.

The characteristics described in section two were used as independent explanatory variables in the regression analysis. As far as possible, independent variables measured at age 12 were used as potential predictors of abuser type as this ensured that, developmentally, they preceded the offending trajectories (this method has been adopted by others, see for example Chung et al 2002). Where characteristics were not available at age 12, data from age 13 were used instead (these were coterminous with the start of the trajectory models). Since data on self-harm and parents' survey data on parental supervision were only available after age 13, they are not included in this analysis. Table 12 shows the independent variables that were used in the regression modelling, and the age at which they were measured.

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<sup>15</sup> Multinomial regression modelling is not used here as the model assumptions are violated by the sheer scale of the independent variables used.

<sup>16</sup> The numbers in some of the trajectory groups were too small to permit analysis of each against the others separately.

**Table 12: Independent variables used in regression modelling**

<b>Independent variable</b>	<b>Values or range</b>	<b>Age at which measured</b>
Gender	0 = female 1=male	12
Socio-economic status	0=non-manual, 1=manual/unemployed	12
Family structure	0=2 birth parents, 1=step-parents, 2=single parent, 3=other carer	12
Parental supervision scale	0 (low) to 9 (high)	12
Gang membership	0=non-gang member 1=gang member	13
Peer influence scale	0 (low) to 15 (high)	13
Weekly alcohol consumption	0=no, 1=yes	12
Drug use in last year	0=no, 1=yes	12
Referral to children's reporter on abuse, neglect or lack of care grounds*	0=no, 1=yes	12
School sector	0=mainstream 1=independent 2=special	12
Self esteem scale	0 (low) to 24 (high)	12
Alienation scale	0 (low) to 24 (high)	12
Impulsivity scale	0 (low) to 24 (high)	12
Frequency of truancy	0 (none) to 11 (>10 times)	12
School commitment scale	0 (low) to 12 (high)	13
Measure of neighbourhood deprivation**	-0.88 (low) to 3.06 (high)	12
Neighbourhood disorder scale	0 (low) to 22 (high)	12
Frequency of victimisation	0 (low) to 35 (high)	12
Frequency of bullying	0 (low) to 12 (high)	13
Frequency of interpersonal assault	0 (none) to 11 (>10 times)	12

Note: variables measured at age 12 had a reference period of 'ever' up to that point.

\* Variable derived from children's hearing records, measuring referrals from birth to age 12.

\*\* Standardised measure derived from 1991 census variables, based on home address at age 12.

The findings from each of the six regression models are presented in table 13, which displays only those explanatory variables that remained significant within the models at the 90% level or above (due to the relatively small numbers in the analysis). The results are presented as odds ratios, which are calculated by standardising the regression coefficients, which allows for more meaningful comparison.<sup>17</sup>

<sup>17</sup> It is possible to compare odds ratios amongst continuous covariates and amongst categorical factors, but it is not technically possible to compare odds ratios of covariates with factors as different units of measurement apply.



Odds ratios can be more easily interpreted for categorical factors than continuous covariates.<sup>18</sup> Simply put, odds ratios greater than 1 indicate that the explanatory variable had a positive effect on the dependent variable, whereas a score less than 1 indicates a negative impact.

Model 1 in table 13 shows various characteristics measured at age 12 or 13 that significantly distinguished those who were involved in animal abuse at any point up from age 13 to 17 from non-abusers. The strongest explanatory variable to emerge was gender: animal abusers were four times more likely to be male than non-offenders, even when controlling for a range of other characteristics. This indicates that there is something important about ‘maleness’ that is not otherwise being measured by the variables used here. Socio-economic status also emerged as a significant factor in differentiating between animal abusers and non-abusers; although, interestingly, the data indicate that abusers were more likely to come from a non-manual (i.e. a more affluent) social background than non-abusers.

Animal abusers were distinguishable from non-abusers by aspects of early risky behaviour, in the form of drug use and higher levels of impulsiveness at age 12. The importance of early peer association also emerged in model 1, as animal abusers were more likely to report involvement in a gang and to be more heavily influenced by their peers at age 13 than non-abusers. Another early risk factor for animal abuse, even when controlling for all the others, was poor commitment to school. However, frequency of interpersonal violence at age 12 did not significantly predict animal abuse in later years. In summary, those who were involved in animal abuse at some point during early to mid adolescence were distinguishable from non-abusers by a range of characteristics measured at an early age which have the potential to be early warning signals for later problematic behaviour.

Models 2 to 6 in table 13 present the results of logistic regression carried out in an attempt to identify early explanatory factors that would distinguish between the different offending trajectory groups. The small numbers in the trajectory groups restricts the reliability of the analysis to some degree, and the results are rather sparse in places. Nevertheless, table 13 presents some interesting differences between the groups.

Model 2 shows that the most chronic abusers were most significantly differentiated from the other offender groups on the basis of gender. High level decliners were nearly four times more likely than other abuser types to be male, even when controlling for a range of other factors. In addition, they reported involvement in significantly higher levels of interpersonal violence at age 12 than other abuser types. The high level decliners, then, presented as boys who were entrenched in an early culture of violence. It may be that earlier data might differentiate this group more clearly from the others.

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<sup>18</sup> For a binary variable (e.g. gender), an odds ratio of 2 can be interpreted as meaning that those with a value of one (i.e. males) are twice as likely to explain the dependent variable than those with a value of zero (i.e. females). For a continuous variable, an odds ratio of 2 can be interpreted such that one standard deviation change in the count of the explanatory variable would increase the frequency of delinquency by two units.

The late starters (model 6) were also more likely to be male than other abuser types; however, they were quite a different group of boys to the high level decliners. The late starters demonstrated good commitment to school at age 13, they were less likely than other offenders to be influenced by their peers at this age and they reported lower levels of interpersonal violence than other abusers at age 12. In other words, these offenders would have been very difficult to identify at an early age as a potentially 'problematic' group, since they appeared to be well adjusted. It would appear that factors occurring during their mid teens influenced their propensity to get involved in animal abuse at a later stage.

Unlike the other types of abuser, the early desisters (model 3) were more likely to be female. They were also distinguishable from others on the basis of a range of problematic characteristics. Early desisters were significantly more likely than other types of abuser to report being in a gang at age 13. Even controlling for gang membership, they were more heavily influenced by their peers at this age. In addition, they were less well supervised by their parents and reported poor commitment to school at age 12. The early desisters, therefore, present largely as troublesome young girls. There is little indication from this analysis why they desist early, although it may be that they mature out of their offending or shift their activities towards other forms of offending behaviour.

The age 14 limited animal abusers (model 4) were distinguishable from other types of animal abuser on the basis of only one covariate, and that was peer influence. Surprisingly, animal abusers who peaked at age 14 were less likely to be influenced by peers at age 13 than other abuser types. The lack of other significant explanatory variables stemming from age 12 or 13 indicates that offending that starts at age 14 is likely to be related to events occurring specifically at that time point i.e. that such adolescent limited offending may be difficult to predict at early ages due to its relatively opportunistic or age-specific relevance at the time of offending. It is interesting to note that age 14 was the peak age of offending for almost all measures of delinquency included in the Edinburgh Study.

The age 15 limited abusers (model 5), on the other hand, were quite different from other abuser types. They were significantly more likely to have parents who were in non-manual employment, but contrastingly to live in a neighbourhood of greater economic deprivation. They were more likely to be influenced by peers at age 13, although less likely to be a member of a gang at age 13 than other abuser types. They were also likely to report being well supervised by their parents at age 12. In other words, those who peaked in their animal abuse slightly later in adolescence presented in their early teens as affluent young people from good family backgrounds who did not associate with troublesome gangs, but who were more easily led by peers and who lived in an area of greater social deprivation. These findings indicate that there may be indicators of vulnerability that are measurable at age 12 or 13 that are relevant to their later involvement in animal abuse; however, like the age 14 limited abusers, there are likely to be factors that spark off their offending at age 15 that cannot be measured at an early age.

**Table 13: Binary logistic regression model results**

Group membership to be explained:	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Animal abusers (ever)		High level decliners		Early desisters		Age 14 limited offenders		Age 15 limited		Late starters	
<i>Reference group:</i>	<i>Non-abusers</i>		<i>Other animal abusers</i>		<i>Other animal abusers</i>		<i>Other animal abusers</i>		<i>Other animal abusers</i>		<i>Other animal abusers</i>	
	Odds ratio	p value	Odds ratio	p value	Odds ratio	p value	Odds ratio	p value	Odds ratio	p value	Odds ratio	p value
Gender (male)	4.361	.000	3.734	.031	.516	.006	-	-	-	-	2.146	.051
Socio-economic status (non-manual)	1.300	.018	-	-	-	-	-	-	1.541	.097	-	-
Drug use at age 12 (yes)	1.675	.005	-	-	-	-	-	-	-	-	-	-
Impulsivity at age 12 (high)	1.034	.002	-	-	-	-	-	-	-	-	-	-
Gang member at age 13 (yes)	1.721	.000	-	-	1.460	.085	-	-	.489	.015	-	-
Peer influence at age 13 (high)	1.062	.000	-	-	1.054	.080	.938	.039	1.072	.056	.893	.009
School commitment at age 13 (high)	.949	.023	-	-	.915	.025	-	-	-	-	1.133	.071
Interpersonal violence at age 12 (high)	-	-	1.104	.007	-	-	-	-	-	-	.886	.011
Neighbourhood deprivation at age 12 (high)	-	-	-	-	-	-	-	-	1.093	.039	-	-
Self esteem at age 12 (high)	-	-	-	-	-	-	-	-	-	-	-	-
Alienation at age 12 (high)	-	-	-	-	-	-	-	-	-	-	-	-
Parental supervision at age 12 (high)			-	-	.909	.066	-	-	1.145	.040	-	-

Notes: non-abusers n=3666, abusers n=491; high level decliners n=45; late starters n=64; early desisters n=159; age 14 limited abusers n=104; age 15 limited abusers n=119.

The findings shown in table 13 strongly indicate that while there may be some early warning signs that could usefully be targeted in terms of general prevention and intervention, early prediction of specific animal abuser type is fraught with difficulties. The model which produced the most useful set of risk factors was that for early desisters (model 3), at which the 'peak' age of offending coincided most closely with the point of measurement of the explanatory factors used. The later the age of onset of animal abuse, the less useful the characteristics measured at age 12 or 13 were for identifying potential risk factors (and, in fact, the greater the number of potential protective factors that emerged). This indicates that the factors which precipitate animal abuse from age 14 onwards are likely to be directly related to the individual and situational circumstances that coincide with the offending behaviour. Importantly, although involvement in frequent interpersonal violence is predictive of early onset, high level animal abuse, it does not predict involvement in animal abuse that starts later in adolescence. Early prediction models are, therefore, likely to yield a high rate of false positives and may be at best ineffective, and at worst potentially damaging, if intervention is targeted against the wrong groups of individuals.

## **Summary of section four**

This section of the report uses multivariate analysis to explore the relative importance of early explanatory variables (measured at age 12 or 13) in predicting young people's propensity to abuse animals and to be in one animal abuse trajectory group as opposed to the others. Findings show that those involved in animal abuse at some point in adolescence are more likely than non-abusers to be male, from an affluent social background, display early risky behaviour (drug use and impulsiveness), be a gang member and be influenced by the peer group at age 13 and to be poorly committed to school at this age. However, more detailed analysis of different abuser types indicates that it may be difficult to differentiate between those who start offending at different ages on the basis of characteristics measured at age 12 or 13.

High level decliners present as predominantly violent males at age 12 but, given that their level of animal abuse is already high by age 13, earlier data would be required to determine what factors predicted their behaviour prior to onset of offending. Early desisters, who are involved in as much animal abuse as high level decliners at age 13 but who display a sharply divergent behavioural trajectory, present mainly as troublesome girls who may simply mature out of their offending or transfer to other types of offending behaviour. Age 14 limited abusers are largely indistinguishable from other abuser types on the basis of characteristics measured at age 12 or 13. Amongst the age 15 limited abusers there are elements of vulnerability, such as early peer influence and living in an area of greater deprivation, but also protective factors such as non-gang membership, social affluence and good parental supervision. The late starters (who commence around age 16) are predominantly non-violent boys who are committed to school and not influenced by peers in early adolescence.

The findings from this multivariate analysis indicate that the later the age of onset of animal abuse, the less likely it is that characteristics at age 12 or 13 can be used to predict animal abuser type, since offending is likely to be precipitated by a range of individual and situational circumstances that coincide with the point of offending and which may, very well, change with age. Prediction models, especially if based on

early involvement in interpersonal violence, are unlikely to correctly identify abusers who will start offending later in adolescence, and could potentially damage individuals who are wrongly targeted with intrusive intervention.

## CONCLUSION AND POLICY IMPLICATIONS

This report has shown that animal abuse is a relatively rare form of offending amongst adolescents in comparison to other forms of both violent and non-violent offending. Amongst those who have harmed an animal, most offend infrequently and for a short period. Nevertheless, around one in five offenders at all ages reported involvement in more than five incidents of animal abuse during the previous year; while around one in eight abusers were active over a period of three years or more. A longer duration of offending is associated with far higher average rates of offending, indicating that the longer the time span of their offending, the greater the risk abusers present to animals in terms of their frequency (and, potentially, their seriousness) of offending.

Animal abuse is similar in prevalence terms to more serious types of offending (e.g. robbery, housebreaking and fire-raising); although it shows most similarity in frequency terms to less serious offences like breach of the peace and shoplifting, but also to interpersonal assault. The strong, positive relationship between frequency of offending and duration of offending which was observed for animal abuse is common to all other forms of offending, thus emphasising the general value of early intervention. Overall, trends in animal abuse follow a general pattern of adolescent delinquency which makes it important to consider such behaviour within the context of a wider offending repertoire.

Animal abusers share some characteristics with other types of offender, particularly those involved in other violent offending. However, there are other aspects of their individual, familial, social and environmental backgrounds that identify them as a distinct category of offenders. Compared to others, animal abusers are more likely to be male; highly impulsive; poorly supervised by parents; less committed to school; more highly influenced by their peers; be members of a gang; drink alcohol frequently and use drugs. They are also more highly victimised and more likely to have deliberately self harmed. On the other hand, they are more likely than other violent offenders to come from an affluent family background, have better self-esteem and are less likely to be bullied. Despite these apparent 'protective' factors, animal abusers present as a problematic, risk prone, vulnerable and deprived group. Any strategy for dealing with animal abusers needs to take these underlying needs into account.

There are different developmental trajectories amongst animal abusers, which are related to a certain degree to developmental trajectories in interpersonal violence, including a mutual increase in the frequency of involvement in one form of violence with the other. Desistance from animal abuse is associated with desistance from interpersonal violence (at both high and low levels), indicating a transient involvement in generalised low level violence. Animal abuse that peaks later in adolescence is also short-lived, but may be characteristic of a generally more violent demeanour. Animal abuse that only starts at age 16 does not appear to be strongly associated with any trajectory of interpersonal violence and may represent a distinct category of violent offender. However, involvement in persistent and frequent animal abuse is associated with persistent and frequent interpersonal violence, representative of a more entrenched culture of adolescent violence.

Analysis to identify predictors of animal abuse reveals some early warning signals that could be used to inform general prevention programmes in early adolescence.

Even when controlling for a range of other influences at age 12 or 13, future animal abusers are most likely to be boys, those from more affluent family backgrounds, impulsive children, those who display early risky behaviour (such as drug use), children who associate with a gang, those who are easily led by their peers, and children who demonstrate poor commitment to school. However, early prediction models to identify specific types of animal abuser are fraught with problems and could potentially yield a high rate of false positives. Factors which precipitate animal abuse at different ages appear to be directly related to the individual and situational circumstances that coincide with the offending behaviour. Importantly, although involvement in frequent interpersonal violence is predictive of persistent animal abuse that starts early in adolescence, it does not predict involvement in animal abuse that starts later. Early intervention that targets the wrong groups of individuals runs the risk of being potentially damaging.

Perhaps one of the most interesting features of the analysis presented in this report is that experience of general victimisation and bullying do not predicting later involvement in animal abuse. Of course, one of the limitations of the Edinburgh Study at present is that there are no available data on child abuse or neglect from the self-reports of the cohort members. Early child maltreatment or neglect that was known to official agencies did not predict later involvement in animal abuse; however, this could potentially be an artefact of the selection effects that divert more affluent youngsters away from the Scottish children's hearing system (see McAra and McVie, 2005). It is not possible to draw conclusions about the potential effects of domestic violence and child abuse from other forms of victimisation; however, these findings do highlight the importance of recognising that many abusers may fall through the net of official help and support.

Given that animal abuse predominantly occurs in early adolescence (up to age 15), prevention strategies would be most effectively implemented within an educational setting, preferably starting in primary school and continuing into secondary school. Rather than treating it as a 'specialist' subject, however, preventative work should form part of a broad programme of education that focuses on a range of forms of offending and anti-social behaviour. Animal abuse should be 'mainstreamed' and dealt with in the context of other forms of violence, particularly interpersonal assault. It would be important to ensure that those who were disengaged with the education process at an early age were included in such initiatives, as they may be more susceptible to becoming animal abusers. Since most children do not harm animals, and probably have a healthy respect for and relationship with pets and other wild animals, group work that used peer influence to challenge particular behaviours may be particularly effective in tackling animal abuse, especially amongst the boys.

This research also identifies some implications for generic intervention strategies, particularly amongst those who are identified by official agencies as vulnerable, problematic and risk prone young people. There is a difficult balancing act to be achieved, as agencies need to be sensitive to those characteristics that may increase risk of involvement in animal abuse, while at the same time resist labelling young people at an early age. Early involvement in frequent violence amongst boys may be a good indicator of persistent animal abuse; however, it is not a certainty. Where animal abuse is identified, the important thing is to ensure early intervention to reduce

the likely scale and seriousness of offending. It is important to recognise, however, that social class may be a barrier to identifying animal abusers in many cases.

Analysis of the Edinburgh Study data leaves many questions unanswered, and identifies a considerable number of issues for future research. While it is hoped that the value of longitudinal data has been demonstrated, such research needs to be done over a much longer period of time, starting earlier in the life course and following offenders through until much later in life to produce more accurate and informative developmental trajectories. The findings from this research also need to be substantiated, possibly using a much larger sample to do so (such as a national population survey). Although quantitative data are revealing in certain respects, the explanations posited in this report need to be confirmed by more qualitative investigation to identify whether these types of offender actually exist and, if so, what this kind of offending means to them. Finally, any future research must include good measures of family conflict and domestic abuse to build up a more comprehensive picture of violence within the household and beyond.



## APPENDIX A: VARIABLES USED IN ANALYSIS

### *Socio-economic group*

At sweep one, respondents' descriptions of their parents' occupations were coded using the Registrar General Social Classification Scheme (RGSC). The socio-economic group (SEG) of the parent in the highest class grouping (with full time workers taking precedence over part time workers) was assigned to the child. Unfortunately, SEG could be assigned to only 61.4% of the cohort. At sweep four, a survey of parents' provided more precise and up to date information on SEG for 69.5% of the cohort. Despite the three year gap between the two sources of data, they were strongly correlated (0.637) showing considerable stability over time. Therefore, the sweep four SEG was used and, where this data was missing, sweep one data was substituted. This process produced a socio-economic group code for 88.3% of all cohort members. To make analysis simpler, and to allow reasonable leeway for error, the respondents were divided into two broad social class groupings according to whether their parents' occupation was classed as 'non-manual' (i.e. SEG groupings I, II and IIIa) or 'manual or unemployed' (i.e. SEG groupings IIIb, IV, V and unemployed).

### *Family structure*

At each sweep of the study, respondents were asked whether about their current family structure and who they lived with. If they spent some time in one household and some time in another, they were asked to distinguish these two households. Using the responses to these questions, it was possible to distinguish those who were living with both birth parents consistently across the five sweeps from those who had experienced some form of parental disruption or separation. Where data were missing at any sweep, it was assumed that their parental status had not changed in the last year.

### *Impulsivity*

A modified version of the Eysenck Impulsivity Scale was used to measure lack of constraint amongst the cohort members at sweeps one, three and five of the Edinburgh Study. The original measure had 27 items but this was reduced to six after careful piloting with a sample of 108 children prior to sweep one. Some changes of wording were made to make the statements more appropriate for the age group and the response format was changed to a 5-point verbal scale (from strongly agree to strongly disagree). The individual items used in the questionnaire were:

- Planning takes the fun out of things
- I get into trouble because I do things without thinking
- I put down the first answer that comes into my head on a test and often forget to check it later
- I get involved in things that I later wish I could get out of
- I sometimes break rules because I do things without thinking
- I get so excited about doing new things that I forget to think about problems that might happen

Each item was scored from 0 to 4, with a high score corresponding to a more

impulsive personality. A high level of internal reliability was found between the individual items at sweeps one, three and five, with Cronbach's alpha scores of .787, .734 and .772 respectively. The composite impulsivity scale was created by adding the scores from the six items together, producing a range from 0 to 24. Correlation scores showed that there was a strong relationship between level of impulsivity at sweeps one and three (.402) and between sweeps three and five (.508). The correlation score between sweeps one and five was weaker (.324), but was still highly significant at the 99% level. This indicates that level of impulsivity between the ages of 12 and 16 displays a high degree of stability.

### *Alienation*

A modified version of the Alienation scale of the MPQ was used to measure aspects of alienation or social isolation amongst the cohort members at sweeps one, three and five of the Edinburgh Study. The original measure had 17 items but this was reduced to six after piloting sweep one (see above). Some changes of wording were made to make the statements more appropriate for the age group and the response format was changed to a 5-point verbal scale (from strongly agree to strongly disagree). The individual items used in the questionnaire were:

- Lots of people try to push me around
- Some people are against me for no good reason
- My friends often say or do things behind my back
- I would be more successful if people didn't make things hard for me
- I know that people have spread lies about me on purpose
- Some people would like to take away what success I have

Each item was scored from 0 to 4, with a high score corresponding to higher feelings of alienation. A high level of internal reliability was found between the individual items at sweeps one, three and five, with Cronbach's alpha scores of .848, .855 and .832 respectively. The composite alienation scale was created by adding the scores from the six items together, producing a range from 0 to 24. Correlation scores showed that there was a strong relationship between level of alienation at sweeps one and three (.425) and between sweeps three and five (.462). The correlation score between sweeps one and five was weaker (.324), but was still highly significant at the 99% level. This indicates that level of alienation between the ages of 12 and 16 is highly stable.

### *Self-esteem*

A modified version of the Rosenberg Self-Esteem scale) was used to measure self-esteem or feelings of self worth amongst the cohort members at sweeps one, two, four and six of the Edinburgh Study. The original measure had 10 items but this was reduced to six after piloting at sweep one (see above). As with the measures of impulsivity and alienation, a 5-point response scale was used (from strongly agree to strongly disagree). The individual items used in the questionnaire were:

- I like myself
- I often wish I was someone else
- I am able to do things well
- I have a low opinion of myself (sweep 1 only)

- I don't think much of myself (sweeps 2, 4 and 6)
- I feel I have a number of good qualities (sweep 1 only)
- There are some good things about me (sweeps 2, 4 and 6)
- There are lots of things about myself I would like to change

Each item was scored from 0 to 4, with a high score corresponding to higher self-esteem. A high level of internal reliability was found between the individual items at sweeps one, two, four and six, with Cronbach's alpha scores of .722, .742, .803, .813 respectively. The composite self-esteem scale was created by adding the scores from the six items together, producing a range from 0 to 24. Correlation scores showed that there was a strong relationship between level of self-esteem at sweeps one and two (.593), between sweeps two and four (.568) and between sweeps four and six (.596). The correlation score between sweeps one and six was weaker (.357), but was still highly significant at the 99% level. This indicates that level of self-esteem between the ages of 12 and 17 displays a high degree of stability.

### *Peer influence*

Many studies have found a strong relationship between self-reported offending and friends' offending (Junger-Tas, 1988; Hagell and Newburn, 1994). However, less is known about the way in which young people perceive the influence of their friends on their behaviour. In order to ascertain the extent to which young people thought they would be swayed by their peers against their better judgement, a series of questions was asked at sweep two, which were then repeated at sweep six. The items included in these questions are listed below:

- How likely is it that you would still hang around with your friends if they were getting you in trouble at home?
- How likely is it that you would still hang around with your friends if they were getting you in trouble at school?
- How likely is it that you would still hang around with your friends if they were getting you in trouble with the police?
- How likely is it that you would do what your friends said if they told you to do something that you thought was wrong?
- How likely is it that you would do what your friends said if they told you to do something that you thought was against the law?

Responses ranging from 'not at all likely' to 'very likely' resulted in a score for each item of between 0 and 3. A high level of internal reliability was found between the individual items at sweeps two and six, with Cronbach's alpha scores of .818 and .792 respectively. The composite peer influence scale was created by adding the scores from the five items together, producing a range from 0 to 15. Correlation scores showed that there was a significant, albeit not strong, relationship between level of peer influence at sweeps two and six (.267).

### *Victimisation*

There is a large body of evidence that demonstrates a close relationship between offending and victimisation. There are various possible reasons for this. For example, some crimes may arise out of mutual interactions between people, to the extent that victims and offenders are almost interchangeable; offenders and victims

may be socially linked in some way; or offending and victimisation may feed off each other in the process of individual development. An important aim of the Edinburgh Study is to examine these linkages, and therefore information was collected about victimisation as well as offending at every sweep. Respondents were asked whether they had experienced five kinds of delinquency (although whether or not these would have been treated as criminal offences is not known as no further detail was collected on these incidents). As in the case of the questions on self-reported delinquency, the period covered was 'ever' at sweep 1, and the last school year at subsequent sweeps. The five items are listed below:

Did anyone:

- Steal something of yours that you left somewhere?
- Use threats or force to steal or try to steal something from you?
- Threaten to hurt you by hitting, kicking or punching you?
- Really hurt you by deliberately hitting, punching or kicking you?
- Really hurt you by deliberately hitting you with a weapon?

For each item where a respondent said they had experienced one of these forms of victimisation, they were asked how many times this had happened. For those where it had happened more than 10 times, the number was capped at a total of 11. The total number of incidents were then added together to give a cumulative score of frequency of victimisation, ranging from 0 to 55.

#### *Neighbourhood deprivation*

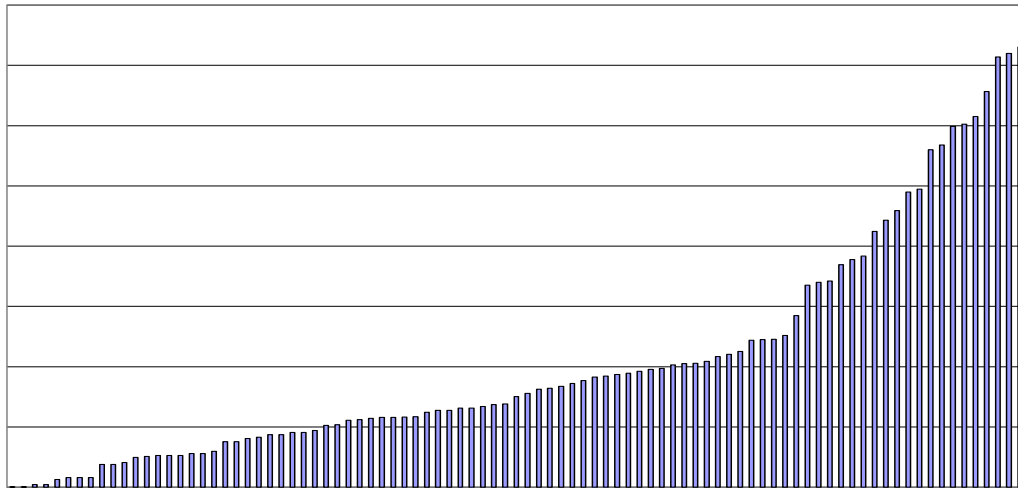
Using geographic information system (GIS) software, the City of Edinburgh was divided into 91 distinct neighbourhoods with an approximate population of 4,500 to 5,000 in each.<sup>19</sup> The building blocks from which the 91 neighbourhoods were constructed were Output Areas (OAs).<sup>20</sup> Clusters of around 45 OAs were formed, the boundaries of which coincided with physical features which influenced perceptions of neighbourhood identities, including roads, names and recognisable features that marked one distinct area from another. Boundaries were chosen which maximised homogeneity within neighbourhoods, and heterogeneity between contiguous neighbourhoods, based on key measures from the 1991 census. Cohort members were allocated to neighbourhoods according to their home postcode at sweep one, and then annually from sweep four onwards. Using principal components analysis, four of the census variables used to construct the neighbourhoods were found to be good indicators of economic deprivation:

- % of households consisting of lone parents with dependent children (single parents)
- % of households with more than one person per room (overcrowded)
- % of households in local authority housing (LA renting)
- % of the population who are out of work (unemployment)

<sup>19</sup> For a more detailed discussion on how the neighbourhoods were constructed see Chapter 14 of Smith et al (2001) and Chapter 3 of Brown (2004).

<sup>20</sup> Output Areas (OAs) are the very smallest geographical units in Scotland which contain, on average, 50 households and 100 people living within a small number of postcodes. In 2001, the City of Edinburgh had 3974 OAs.

The distribution of social deprivation is shown in A1 below.<sup>21</sup> The distribution of both graphs is curvilinear, with some extreme outliers at the higher end of the neighbourhood instability measure.



**Figure A1: Distribution of social deprivation across the 91 Edinburgh neighbourhoods at sweep 1**

#### *Neighbourhood disorder*

We used the concept of ‘incivilities’ introduced by Wilson and Kelling in their famous article about ‘broken windows’ (1982) to mean signs of disorder which show that unwanted behaviour is not effectively controlled. Respondents were asked whether each of the following incivilities was a problem in their neighbourhood:

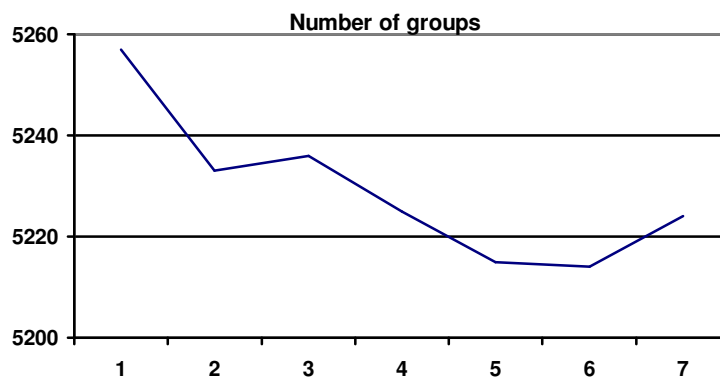
- Rubbish in the street
- Broken windows in shops or buses
- Vandalised or burnt out cars
- Dog dirt on pavements, grass, etc.
- People who are drunk in the street
- Gangs of young people
- Boarded up or burnt out houses
- Not enough street lights
- Graffiti on walls or building
- Vandalised buildings or bus shelters
- People selling drugs
- Drug needles (or syringes) lying around
- Busy roads or heavy traffic
- Neighbours fighting in the street

Each item was rated on a three-point scale (from 0 for not a problem to 2 for a big problem). The results were used to compute a ‘perceptions of incivilities score’ ranging from 0-28. This scale has very high reliability and internal coherence (cronbach’s  $\alpha = .9038$  for sweep one). The mean scores were then computed for each of the 91 neighbourhoods.

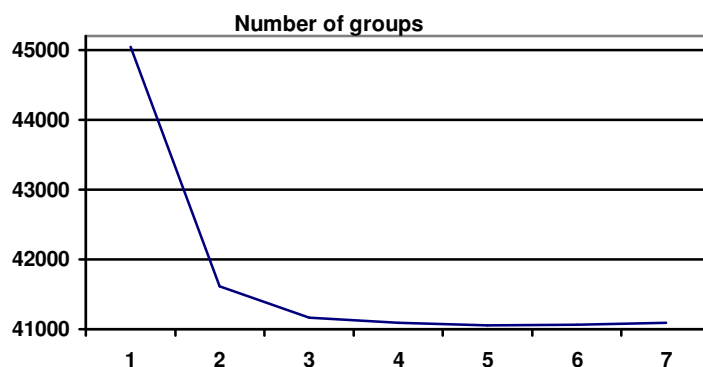
<sup>21</sup> This figure shows the distribution of social deprivation across the 91 neighbourhoods, from lowest to highest. No scale is shown as the data are standardised and the scale is relatively meaningless.

## APPENDIX B: NUMBER OF TRAJECTORY GROUPS

Semi-parametric group based modelling (SGM) operates on the basis that a number of groups are specified and the programme then finds this number of groups according to the best statistical ‘fit’ of the data. A key issue in trajectory analysis is how to decide on the optimal number of groups to select<sup>22</sup>. Nagin (2005) recommends using the Bayesian Information Criterion (BIC) to provide a statistical indication of the appropriate number of distinct groups. This involves creating a series of models which specify a different number of groups. The model with the BIC statistic closest to zero is considered to be the best fitting model. Figure B1 shows a graph of the BIC statistic for a series of models based on the frequency of animal abuse, ranging from a model that specified only one group to a model that specified seven groups. The optimum BIC is actually for six groups; however, it is important to also use common sense and theoretical reasoning in selecting groups by observing the pattern of the trajectories that emerge. Visual examination of the six trajectory groups revealed that two of the groups were virtually identical, so the five group model was used instead. Figure B2 shows a graph of the BIC statistic for a series of models based on the frequency of interpersonal violence, which ranges from one to seven groups. In this case, a five group model had the lowest BIC and was assessed to be the optimal number for this variable.



**Figure B1: Bayesian Information Criterion frequency of animal abuse, by number of groups specified**



**Figure B2: Bayesian Information Criterion frequency for interpersonal assault, by number of groups specified**

<sup>22</sup> A systematic review of semi-parametric mixed Poisson regression modelling carried out by D’Unger et al (1998) concluded that four or five trajectory groups was usually sufficient.

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